

SOUTHERN CENTRE FOR
INEQUALITY STUDIES

Perspectives on the Care-Climate Nexus

Contributions by

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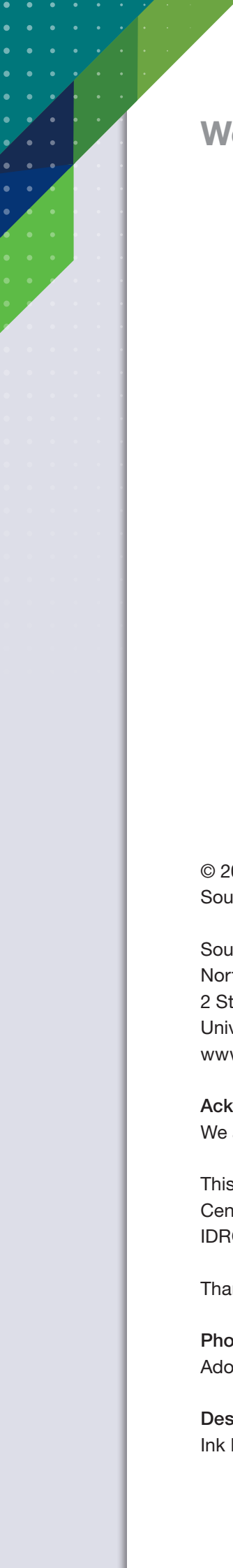
SOUTHERN CENTRE FOR
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STUDIES



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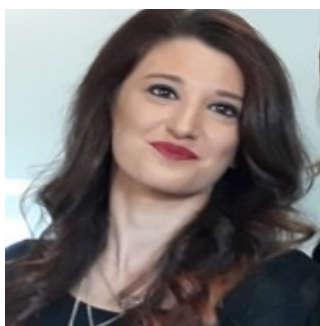
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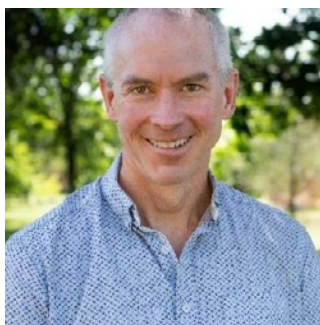
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My research team studies the role of glaciers in the water cycle and the global climate system. I have spent about two years of my life camped on glaciers doing research on glacier-climate processes and glacier response to climate change, and have had the privilege to spend time in western and Arctic Canada, the Alps, Iceland, and Greenland. My research examines the impacts of glacier change on water resources and sea-level rise, including a blend of field work, glacier modelling, and work to improve the representation of glaciers and ice sheets in climate models.



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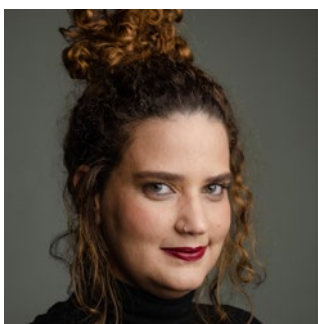
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She is a fellow of the Royal Society of Canada, a member of the Sectoral Table on the Care Economy for the Employment and Social Development Canada (ESDC), and a distinguished fellow of the Asia Pacific Foundation of Canada, currently serving as a thought leader for the foundation's Women's Business Missions to Asia Pacific initiative. She was a co-lead for the Room 5 for the Rockefeller Foundation-Brookings Institute's 17-Rooms Global Flagship project (2021–2023).



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FOREWORD

By Imraan Valodia

The contemporary global political and economic landscape is defined by intersecting crises that are significantly jeopardising the sustainability of all life forms on Earth. The climate crisis and the crisis of care stand out as two important, yet often separately researched, problems that are the defining crises of our time. The unfolding climate emergency that is caused by unsustainable production and consumption patterns is causing long-term destruction of the environment and exacerbating global inequalities. The same economic systems that valorise the over-exploitation of natural resources and caused the climate crisis are leading to the systematic undervaluing of care work. The crisis of care reveals an inability of our economic system to sustain the crucial labour that is required to maintain human and planetary well-being. Human life depends on care. And yet care remains undervalued, unrecognised and unsupported.

Despite the intricate interconnectedness of care and climate – what we refer to as the Care-Climate Nexus – the intersections remain under-researched in academic discourses and largely absent in policy. Addressing them in isolation severely limits our policy solutions. What is needed is an integrated framework for analysis of the Care-Climate Nexus. In line with this, we have developed a Care-Climate conceptual framework that functions as a tool for understanding how the undervaluation of care and the exploitation of nature are structurally linked. This framework provides a foundation for rethinking climate policy through the lens of care, emphasising the need to centre care work – not only as a practical human necessity but by also as an ethical and political imperative – now more than ever we need to care for each other and for nature.

Building on this conceptual groundwork, this compendium of think-pieces expands and deepens our analysis of the Care-Climate Nexus by bringing together feminist scholars and climate scientists who have also been thinking deeply about this nexus with us. One key insight that emerged very strongly from their contributions is that climate policy must include investments in care systems that are capable of buffering vulnerable communities from climate disasters.

I extend my sincere gratitude to the International Development Research Centre (IDRC) for supporting this research initiative and providing a platform for meaningful intellectual engagement. I am also deeply appreciative of the working group and all contributors to this booklet, whose scholarship and commitment have been instrumental in shaping this work.

By centring the care-climate nexus in both academic and policy discourse, this project challenges dominant economic paradigms and offers a vision for a future in which care – for people and the planet – is foundational to our response to the climate crisis. The analyses presented here not only serves as a scholarly intervention but also as a call to action: to rethink what we value, how we measure progress, and how we can build a just and liveable world for generations to come.

INTRODUCTION

Facing the climate crisis with care: Why care is indispensable to tackling climate change¹

AUTHORS

Imraan Valodia, Director, Southern Centre for Inequality Studies

Sonia Phalatse and Julia Taylor Researchers at the Southern Centre for Inequality Studies

Communities across the world are facing two worsening crises: a climate crisis and a care crisis.

The evidence and urgency on the climate crisis has been expertly illustrated by the Intergovernmental Panel on Climate Change (IPCC). The root cause of this crisis is the increase in greenhouse gases in the atmosphere. This is due to excessive exploitation of fossil fuels, deforestation and industrial processes. In short, it is a result of development processes that have not been based on caring for the environment.

Less discussed is the care crisis. This refers to a society's capacity to maintain livelihoods in households, raise children and sustain communities. In short, the care crisis is a result of not investing enough in caring for each other.

Addressing these crises requires acknowledgement of the interdependency of people, other species and the physical environment. Our failure to invest sufficiently in caring for each other, other species and our environment is a root cause of climate change. We refer to this as the "care-climate nexus". As the effects of climate change intensify, we will need to care for each other more than ever before, and we need systems to enable better care of our environment.

There is a growing discussion linking gender and climate change. However, the links between climate change and care have been largely under-researched.

The climate crisis stems, similarly to the care crisis, from an economic paradigm that undervalues care – both for each other and for our physical environment. The concept of care therefore can serve as a powerful focal point for understanding the climate challenge and for policies towards a sustainable and equitable future.

This is the gap that the "care-climate nexus" project led by the [Southern Centre for Inequality studies](#), in collaboration with the [International Development Research Centre](#) and a group of feminist economists and climate scientists from across the world, plans to fill.

¹ A shorter version of this paper was published on The Conversation on link:

The research project has two main objectives. First, to map the conceptual links between climate change and care.

Second, to inform and support policymakers to include care in climate policy. For example, significant investments in quality care that supports climate adaptation are as important as building resilient infrastructure and can reduce the burden on those who carry out care work. Climate policy that does not centre care risks replicating or even exacerbating structural inequalities.

Undervaluing care and nature

The climate and care crises have resulted from the undervaluing of two things – nature and care work.

Indicators such as gross domestic product (GDP) place value on – and reward – unsustainable exploitation of natural resources. Too little – or no – value is placed on the natural environment. The consequences are proving dire. Continued exploitation of raw materials and natural resources has come at the expense of the environment. The undervaluing of nature has caused pollution, loss of habitats, extinction of species and declining biodiversity.

Similarly, no value is placed on unpaid care work. What is measured and “valuable” in the calculations of GDP in an economy excludes unpaid care work, even though it is essential for sustaining livelihoods and therefore economic activity.

Care work has been cast as “women’s work”, although men do it too. On average, women and girls in the global South undertake over three times more unpaid care work than men.

The disproportionate responsibility for this work restricts women and girls’ opportunities to pursue education or employment. The undervaluation of care work reflects gender norms that regard women’s work as inherently less valuable and as something that is endless and free.

Climate change poses threats to food security, water accessibility, health and livelihoods, among many other impacts. Unpaid or under-paid tasks like providing food, collecting water and caring for the young, ill and elderly will be made more difficult by the impacts of climate change.

As we have shown above, these tasks are often, but not exclusively, carried out by women. There is also a growing trend in the global North for this work to be outsourced to women immigrants and the working class.

Anchoring care in climate policy

It is possible for humans to contribute to the regeneration of the environment instead of its depletion. But this calls for a rethink: what we value and whether this is represented in our current economic systems and policies.

The care-climate nexus conceptual framework makes two key arguments:

- One is for an expansive view of care that goes beyond person-to-person care to include caring for the environment. Centering care in responding to the climate crisis requires understanding diverse meanings and articulations of care, that include understandings of care in different contexts from the global South.
- Second, care is not only a practical concern but also an ethical and political one. It involves recognising that everything we do to maintain, continue, and repair our world is significant and crucial for life on Earth.

A focus on care and climate change means understanding and addressing interconnected socio-economic challenges. These include:

- the impact of climate change on the provision of care. Climate change adds to the unequal burden of unpaid caregiving and care work, which carries substantial economic and social repercussions.
- the conditions of care work. The labour that goes into maintaining households, raising and birthing children and sustaining communities more broadly is being undermined by an economic and social system that systematically undervalues care.
- the protection of farm workers' rights. Many in rural communities in the global South work on farms, where their agricultural labour is seen as an extension of their domestic care duties and is often precarious. Yet rural communities often do more than their share of environmental care. These forms of work should be protected and valued.
- the impact of the privatisation of public and social services on the provision of care. The growing privatisation of care services globally, like healthcare, and cuts in public expenditure on these vital services, has made it difficult for the majority to obtain proper care. Quality healthcare, for example, is out of reach for many.
- addressing the fact that care work extends beyond domestic work and includes caring for nature, land and animals.

With this in mind, what would a climate change agenda look like if it had care more centrally focused in how we understand the causes and solutions to climate change? Our research confirms that a crucial first step is for care work to be socialised and not individualised as 'women's work'. Addressing both care inequalities and climate change will require the support of activities that promote a more systemic and long-term approach to climate change, which should also be done based on context-specific factors and involvement of local communities and traditional / indigenous knowledges. This requires a focus on climate policies that address both mitigation and adaptation simultaneously.

A shorter version of this introduction was published as an op-ed on The Conversation [here](#).

SECTION 1

Caring for people, caring for the planet: Depletion and degradation vs. replenishment and regeneration

AUTHOR

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1.1 Introduction

Both climate scientists and feminist social scientists are concerned with the well-being of people and the planet, but they belong to different disciplines and use different tools of analysis.

Climate scientists may think that feminist social scientists mainly want to “add women” to the analysis about the impact of climate change on people. And indeed, there is a large amount of research which does just that (see for example, the comprehensive report by Patel et al. 2023).

The United Nations Framework Convention on Climate Change (UNFCCC) includes a Gender Action Plan (GAP), adopted in 2017. The GAP is a framework that aims to “enhance the gender responsiveness” of climate policy and climate action. It outlines specific actions and strategies to promote gender equality and the participation of women in several aspects of climate change mitigation, adaptation, finance, capacity building and decision making.

This is in line with the mainstream approach to gender and climate change that focuses on “including women”:

- In the sectors that are the focus of transition to carbon neutral economies;
- In the finance (public and private) allocated to investments in transition;
- In the decision-making bodies (public and private) that focus on transition.

But feminist social scientists are also producing analysis that goes beyond this. They have long been concerned with highlighting the importance of care in economic and social systems, care which is predominantly the work of women and girls, and much of which is unpaid. They have analysed the importance of care to human well-being and to the functioning of economies (see, for instance, Folbre, 2006).

Feminist social scientists may think that climate scientists deal mainly in abstracts, such as increases in global temperature of 1.1 degrees in the period since industrialisation began. But

many climate scientists are realising that assessments of climate change need to be translated into tangible assessments of contemporary impacts on people if action is to be taken to halt harmful climate change (see, for instance, Fitchett, 2024). They have begun to consider how poverty and inequality shape the impact of climate change on livelihoods, and the possibilities for resilience, mitigation and adaptation (IPCC, 2022).

Both climate scientists and feminist social scientists have an interest in analysing the forces that are shaping the care of planet and people; and where necessary, challenging these forces and changing them. This note explores some ideas on the significance of care practices – and care-less practices – for safeguarding both people and planet; and on the need to go beyond adaptation and mitigation to create caring economies in which money and markets serve rather than undermine the well-being of people and planet.

1.2 Conceptualising care for people

I propose to conceptualise care for people as provision of assistance and support for them to carry out daily activities, such as eating, dressing, bathing, learning, exercising, resting, all of which are essential for our well-being and for exercising our capabilities. This captures the relational aspect of care; it recognises the agency of the people being cared for, as well as those providing care.

We all need such assistance and support at some periods in our lives, especially at the beginning and end of our lives. But even if we are a so-called able-bodied adult, with a paid job, we need support and assistance from family and friends to flourish. Recognising this allows scope for reciprocity in providing care, and implicit intergenerational contracts.

However, gender and other inequalities mean that the reciprocity is asymmetric and most of the work of care is carried out by women and girls. Care is provided without pay in families and communities and also by paid employees in households, businesses and public sector facilities. Those providing care, paid or unpaid, are undervalued, and their own care needs neglected.

Good quality care means providing assistance and support in ways that accord dignity and respect to recipients of care; it recognises their capabilities, the role that they play in sustaining their lives and their human rights. Much care does not meet this criterion, but it is hard for carers to provide good quality care when they are not accorded dignity and respect, and their human rights are violated.

A distinction is often made between “direct care work”, which are activities that involve close personal or emotional interaction, such as childcare and elder care; and “indirect care work” that provides support for direct care, such as cooking, washing, cleaning, collecting water and firewood. However, Folbre (2006: 187) points out that almost all activities can be construed as providing support for “direct care”. Not only producing meals, but also producing food, cooking appliances, energy, steel etc. support the provision of “direct care”. If we call all of these activities “indirect care”, then almost the whole economy would comprise “indirect care”. Because of this, in my view, the category “indirect care” is more useful if it is applied only to unpaid activities that take place in households and communities.

1.3 Conceptualising care for the planet

Caring for animals and caring for communal spaces and resources such as water, gardens and forests have been identified as part of indirect care (MacGregor et al., 2022). This makes sense in the context of subsistence economies, but a more expansive understanding of care for the planet is needed for market economies, an understanding that does not confine care for the planet to a subset of care for people.

Thus, I conceptualise care for the planet as providing assistance and support to environmental systems in sustaining their capabilities as they interact with social and economic systems. It is an approach that respects the planet as a living system, respects planetary boundaries, and recognises and supports the possibilities for environmental systems to renew themselves. Good quality care for the planet safeguards animal well-being, soil fertility, water quality, air quality and limits climate risks. It can be embodied in organic and regenerative farming; in rewilding land and protection of wildlife; in sustainable generation of energy; in recycling and re-use; and in sustainable public transport systems. These activities can be unpaid, carried out by household members and community volunteers, or paid, carried out by public and private enterprises that aim for stewardship rather than exploitation of natural resources.

1.4 Feedback loops

There are both negative and positive feedback loops between care for people and care for the planet (Floro, 2024). Good quality care for the planet accords respect to natural resources and does not lay waste to them. But it is hard to provide such care if your survival is in immediate jeopardy and you cannot look ahead beyond the next few months. Deep social and economic inequalities make such conflicts more likely. The immediate pressures to care for your children, to feed them today, may conflict with care for the land you farm, the forests from which you gather wood. It may force you to buy cheap food produced using pesticides that harm wildlife and that are processed in industrialised ways that generate pollution and intensify global warming. And pollution, in turn, harms health and intensifies care needs.

However, if care for people is supported by investments in accessible and affordable systems of care, food, energy, water, transport, etc., then the negative feedback loops can be reversed and converted into positive feedback loops.

1.5 Depletion and degradation vs replenishment and regeneration

Both people and planet are subject to depletion and degradation through the ways in which they are used in production as currently organised. The livelihoods of the majority of people depend directly or indirectly on large enterprises (privately or state owned) and their treatment is shaped by the pressure to generate profits and revenues. Too often people are treated as disposable with little concern for their health and well-being, on the assumption that there will always be labour supplies available as required. Much of the planet is owned by these same large enterprises that use the planet as an instrument for extracting maximum profits and revenues while disregarding non-financial costs.

People's capabilities are depleted and degraded through work that is exhausting and through deprivation of essentials such as food and shelter. The capabilities of environmental systems are degraded and depleted through over-extraction of resources and the overwhelming of sinks for waste.

Care can assist people and environmental systems to replenish and regenerate themselves, but care work is itself also subject to the forces that lead to degradation and depletion. The current economic system promotes the careless use of both people and planet through an emphasis on minimising short-run financial costs.

1.6

Beyond mitigation and adaptation: Creation of caring economies

Underlying the degradation and depletion of people and planet is a finance-driven economic system that values capabilities primarily for the money to be made from them, whether that money takes the form of private profits or revenues for the state.

To support replenishment and regeneration, we need to create caring economies that prioritise well-being rather than financial returns, in which all enterprises, private and public, are required to fulfil a duty of care. Attempts to mobilise finance for investment in mitigation and adaptation can only achieve limited success when the economic system itself is governed in ways that prioritise extracting financial returns rather than fostering the well-being of people and planet.

Feminist social scientists have been developing ideas about what creating a caring economy means. For instance, a UK feminist think tank, the Women's Budget Group, has developed a plan for a caring and green economy for the UK (Diski 2022). The plan identifies four structural changes that are needed:

- **Reorienting the economy:** Put well-being above profit, move away from energy-intensive and polluting industries and towards activities that care for people and planet, and end GDP growth as the main economic objective.
- **Changing ownership models:** Democratise ownership of natural resources and basic services, overhaul the energy system through, among other means, a new public renewable energy company; roll back private provision of care services, end public land sell-offs, and support alternative ownership models throughout the economy.
- **Changing how government raises and spends money:** Put public investment in decarbonising physical infrastructure and expanding social infrastructure at the centre of UK fiscal and monetary strategy, supported by targeted subsidies and progressive taxation.
- **Supporting a global green and caring economy:** Build efforts to reorder the global economy around climate justice through debt relief, gender-sensitive climate finance, reforming international financial institutions, clamping down on tax havens and ending exploitative treaties.

An international coalition of women's organisations rooted in the global South has developed a proposal for a Feminist and Decolonial Green New Deal (Muchhala 2021), which includes a focus on transformation of the international trade and financial architecture. The primary objective of a decolonial global green new deal is to make possible a sustainable and equitable development paradigm that simultaneously achieves poverty eradication and ecological sustainability.

The foundation of such an interdependent paradigm is the Rio 1992 principle of common but differentiated responsibilities (CBDR). Some key components of such a paradigm include structural transformations to current consumption and production patterns, technology transfer and intellectual property rights, non-discriminatory trade policies and a national development model oriented toward economic diversification. (Muchhala, 2021: 5)

The proposal calls for long-term public investments in clean and renewable energy, without replicating the inequities experienced with privatisation and public–private partnership schemes. It calls for a just transition for the workforce in industries that will be run down and emphasises that marginalised and precarious workers must be prioritised in decent work creation initiatives in ways that proactively consider gender, race, caste and ability. The proposal also calls for scaled up, long-term and consistent public investments in care services, alongside public and private divestment from fossil fuels and regulation of the financial sector to divest from harm and invest in care.

1.7 A human rights approach to a caring economy

There is a danger that a focus on care and caring will be counterposed to a focus on justice and human rights. There is a substantial philosophical literature that counterposes an “ethics of care”, emphasising relationships, to an “ethics of justice”, emphasising principles. While we should do everything to encourage ethical, caring behaviour, we cannot rely on good intentions alone. We have to penalise unethical, uncaring behaviour. We have to address the structures of power that underpin a finance-driven careless economy and we have to challenge them.

Human rights provide both relevant principles and national and international arenas to support such challenges. The case for a human rights approach to a gender-just transition is made by Floro et al. (2023) who argue that:

A gender-just transition involves a profound structural change which cannot be achieved through siloes steps. Climate action requires a comprehensive and wide range of mutually supporting policies, going from investments in public services and infrastructure, that reduce inequalities and promote adequate quality universal care, to adopting economic and fiscal tools, that provide States adequate fiscal space and resources to meet this ambitious agenda.

In these efforts, human rights obligations must be at the centre. Using a right-based framework enables one to identify and address power asymmetries throughout the transition process. This is essential to ensure fairness as adaptation and mitigation strategies are constantly confronting intersecting sets of inequalities that profoundly shape responses to the care crisis and climate change. It provides a set of obligations, norms, and principles that can shape priority responses to the needs of people and the planet. For example, the principles of participation and transparency require the opening to public scrutiny of all decision-making processes in areas essential to a just transition, such as energy, financing, fiscal, trade, and industrial policies. (Floro et al. 2023: 34)

Of course, a human rights approach is not a magic bullet, but it does provide a counterweight to technocratic approaches, and it provides a range of arenas for contestation, internationally, nationally and locally. The universalism of human rights is particularly important to counteract approaches to just transition that confine it within national boundaries. The climate crisis is

already creating climate refugees. The shortage of care workers in rich countries is already conducive to trafficking people from poor countries. A human rights approach provides a framework for challenging this.

1.8 Conclusions

The ways in which economies are currently organised promotes a careless use of people and planet, leading to depletion and degradation of their capabilities. We need to create caring economies in which these capabilities are replenished and regenerated. This requires going beyond piecemeal attempts at mitigation and adaptation to introducing system-wide change. Feminist economists and climate scientists working together can help to bring this about.

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SECTION 2

Effects of climate change on the organisation of care provisioning

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2.1 Introduction

The world is witnessing climate destabilisation and increasing fragility of the ecosystem and the consequences of climate change. The consequences of climate change involve not only slow, long-lasting changes in temperature and rainfall but also more intense and frequent extreme weather events such as heat waves, hurricanes, typhoons, flooding and droughts, all of which have compounding effects on families and communities to meet their care needs.

Climate change impinges on care systems in multi-faceted ways. First, it heightens the need for care in terms of sudden illnesses and unexpected disabilities due to climate stressors and climate-related natural disasters. Second, it reduces access to important inputs for care such as water, food and safe shelter. Third, it can bring about new challenges that undermine the availability of family caregivers to provide care and access to care support services through damages in physical and social care infrastructures. Moreover, it can lead to breakdowns or re-composition of traditional units of caregiving, for example, households and communities, while it creates new situations in which meeting care needs are particularly difficult with the increase in displaced person settlements and refugee camps.

The heightened uncertainty in terms of sudden spikes in the demand for care along with serious challenges faced by family caregivers, paid care workers (childcare workers, health care workers, nursing home aides, domestic workers, etc.) and societies in general to meet the growing care needs have immediate and long-lasting effects on human well-being in terms of depletion of capabilities and loss of life.

The size of the current unmet care needs throughout the world is substantial. In childcare alone, about 23% of children worldwide (nearly 350 million) need childcare but do not have any access to it (Devercelli and Beaton-Day, 2020). This unmet need disproportionately impacts families in low- and lower-middle-income countries with nearly eight out of ten children who need childcare not having access to it. Similarly, as the world's population ages rapidly, only a small proportion of those who are elderly and need assistance are able to use formal care, that is, care in an institution or paid home care. The majority of the elderly are cared for by family members or

other unpaid caregivers (Gruber et al., 2023). Historically and to the present, much of this unpaid care and formal care work is provided by women and girls as evidenced in time-use studies (Beneria et al., 2016; Connelly and Kongar, 2017; Hirway, 2017; ILO, 2018).

Access to health care services for hundreds of millions of people around the world remains challenging. Expansion of access to essential health services has slowed when compared to pre-2015, with no significant progress in reducing financial hardship due to increasing health care costs (WHO, 2023). Inequalities persist in these care systems, with the disadvantaged populations having lower levels of access to health and related services.

The impact of both the slow onset of weather changes and sudden occurrence of extreme weather events varies widely across communities and geographical regions, but one thing is clear: their multi-dimensional impacts continue to test the capacities of care systems around the world. They reverberate on the existing care arrangements, whether they are family and community based, market or government provided, formal or informal.

Both the steady, gradual, and long-lasting changes in temperature and rainfall as well as hurricanes, super-typhoons, heat waves and severe flooding are bringing about increased morbidities. At the same time, they create conditions for increased air pollution, extreme heat, incidence of water-borne and air-borne infectious diseases and even epidemics. They also threaten both the quantity and quality of food and water supplies.

2.2 Impact on health, disease burden and sick / disabled care

The 2023 Lancet Countdown report reveals the dire health situation that the world is facing due to climate change: “Adults older than 65 years and infants younger than 1 year, for whom extreme heat can be particularly life-threatening, are now exposed to twice as many heatwave days as they would have experienced in 1986–2005” (Romanello et al., 2023: 1). These conditions are also putting more populations at risk of life-threatening infectious diseases, such as dengue, malaria, vibriosis and West Nile virus (Carleton and Hsiang, 2016). There is also evidence on the connection between anthropogenic climate and recent epidemics such as Ebola and SARS V-2 (Archibong and Annan, 2023; Wilder-Smith et al., 2016). Many of the root causes of climate change, such as deforestation, loss of habitat and decrease in species diversity, have led to closer encounters between wildlife and humans (Bernstein et al., 2022). Through these pathways and zoonotic spillovers, and the presence of a confluence of environmental drivers, climate can dramatically contribute to animal–human and human-to-human transmission of such viruses (Carlson et al., 2022; Rodó et al., 2021).

Rising temperatures and the presence of open water after heavy rainfall and severe floods are two key climatic factors that affect the intensity of infection in both regions where malaria and dengue are endemic, thereby increasing the severity and distribution of malaria and dengue epidemics around the world (Bhatt et al., 2013; Zhou et al., 2004). Extreme weather events such as strong typhoons, hurricanes, severe droughts and flooding often lead not only to an increase in mortality rates due to drowning, heat strokes, wildfires, etc. but also to injuries/disabilities and illnesses.

Climate change interacts with human health in complex ways. Its impact is highly uneven across populations, depending not only on the geographical region but also on the income, education, sex social norms, level of development and the institutional capacity and accessibility of health systems, particularly for marginalised groups. Africa has experienced the biggest increase in heat-related mortality rate since between 2000 and 2005, with more frequent health-threatening temperatures and a growing population of people older than 65 years (Romanello et al., 2023: 10). Africa was also the region most affected by droughts, with 64% of its land area affected by at least one month of extreme drought per year on average between 2013 and 2022, followed by Oceania (55% of its land area) and South and Central America (53%) (Romanello et al., 2023: 10).

Scientific evidence also points to increases in health inequalities caused by climate change. The health effects of climate change are not uniformly felt as they impinge on different population groups in disproportionate ways. The exposure to and severity of the impact and the ability of individuals to recover depend on a variety of factors, such as physiological characteristics, income, education, location, social norms, and the institutional capacity and accessibility of health systems (Costello et al., 2009; Hoffmann, 2021; Li et al., 2023; WHO, 2021; 2023). For example, heat-related risk is found to be stratified across the population and linked to person-specific physiological characteristics, such as age, sex and pre-existing health conditions, and to socio-economic and location-specific factors, such as income, social norms, type of employment, place of residence, type of heating and cooking fuel used in households. Older persons and young children both face high heat-related health and mortality risks (Bartlett, 2008; Gouveira et al., 2003; WHO 2021).

There is also evidence on the disproportionate effect of climate change on the health of people living in poverty and those who belong to disadvantaged groups (Costello et al., 2009; WHOWHO, 2021). Women of lower social and economic status and with lower education are relatively more vulnerable to heat stress than women in wealthier households, belonging to a higher caste or dominant race / ethnicity and with higher education (Benevolenza and DeRigne, 2019; Deivanayagam et al., 2023; Pega et al 2023; Simmonds et al., 2022; Stanke et al., 2013). This is, in part, due to their exposure to pollution in the absence of clean cooking fuel and, in part, due to extreme heat as they walk longer distances to gather water and fuel and / or they engage in brick-making, street vending and other outdoor informal employment.

Elderly women and men as well as those in lower socio-economic status are also more vulnerable to the health effects of floods, typhoons and hurricanes than the rest of the population (Khan et al., 2011; Novales, 2014). The spread of sewage in poor urban areas, for example, has increased the incidence of water-borne diseases (McKee and Cruz, 2021). Increases in incidences of diarrhoea are also connected to elevated salinity levels of groundwater in coastal regions, which can increase maternal mortality and morbidity (Neelormi et al., 2009). Importantly, lack of access to healthcare facilities and the means to pay for medicines make it difficult for women and men in poor and low-income households to recover from their illness.

Mental health problems are being attributed to climate change as well (Romanello et al., 2023; Salick and Byg, 2007). Studies show that the degradation of or forced displacement from familiar or culturally valued environments can bring about direct emotional impacts, ranging from extreme anxiety and apprehension to depression. Given their high exposure and vulnerability to climate risks, marginalised populations during and after a natural disaster tend to experience elevated mental illness due to circumstances pertaining to the weather event and the lack of disaster-response actions.

These adverse impacts of climate stressors and shocks on people's health and well-being, in turn, further increase the demand for caregiving and care workload. Climate-induced health problems result in increased time spent by family and community caregivers in looking after the sick and disabled, particularly frail elderly people and children. The unequal sharing of care work and attempts by women to meet the time demands of both care work and paid work impose significant costs on their well-being as well. Women's health is more vulnerable in terms of exposure to infections and viruses than men because of women's socially ascribed role of caring for sick people (Budlender and Moussie, 2013). The increased time spent on care obligations is likely to further constrain women's labour force participation and the type of jobs that they can undertake, as evidenced by the gender-differentiated employment effects of Typhoon Haiyan in the Philippines, one of the most powerful typhoons in history (Floro and Poyatzis 2019; Novales, 2014). Increased demands for care also significantly reduce caregiver's time for rest and self-care.

2.3 Impact on access to key inputs for care provision

Another channel in which climate change affects care provisioning is through the availability of important inputs for care: these become more scarce and more difficult to obtain. Climate change threatens the availability of food, clean water and safe shelter thereby eroding households' and communities' care capacity and, hence, collective ability to thrive and survive. Fluctuations in food supply and rising food prices due to crop devastation brought about by drought, soil salinity, flooding, etc., along with the inadequacy of government policies in mitigating their effects, underscore the mounting challenge of meeting food needs (Olsson et al 2014; Bene and Devereux 2023). The threat of chronic shortage of safe drinking water has alarmingly risen as well. Vulnerability to water scarcity is intrinsically intersectional and unravels the underlying structural inequalities and gender disparities in access to water resources and water distribution systems (UNICEF and WHO 2019). These climate-related changes in water availability and access affect the ability of households, communities, health facilities, and care facilities to provide care. Care for the sick and disabled, the young and frail elderly involve tasks such as bathing, feeding, washing, giving medicine, etc., which are compromised when water is scarce.

2.4 Impact on physical and social care infrastructures

There are also disruptions in care systems brought about by extreme weather events on physical care infrastructures. Access to care facilities e.g., hospitals, clinics, daycare centres, nursery schools nursing homes, are suspended when severe floodings, super-typhoons, hurricanes and tornadoes, etc. create damage to these facilities. In some cases, damage can be so severe, leading to closure of these facilities. Disaster risk management and recovery plans often fail to account for essential childcare and eldercare services and are not allocated the necessary support and resources for preparedness and recovery.

Another type of care system interference brought about by climate change, albeit indirectly, is the gradual and disparate breakdown of traditional units of care involving extended families and kinship networks, as well as community-based care support provided by friends and neighbours. These informal, inter-household care support systems operate on the basis of trust

and strong family, kinship or community ties whereby households help one another in times of need, including care support (Khalil et al., 2021). These informal care-sharing arrangements are illustrated by Mpanje et al. (2018) in their study of the three large informal settlements in Nairobi. At the time of the survey, about half (50.5%) of the sampled households reported having a sick member in the previous two weeks. The majority of these households relied on close friends and family members living nearby for care and support because of the strong bond, reciprocity and trust that exists within sections of these vulnerable urban settings (Mpanje et al., 2018: 8).

Studies have shown that climate change eventually leads to livelihood loss and resource scarcity, which can weaken social cohesion and local safety nets in affected communities (Otto, 2017). For example, Buechler (2009) found declining social reciprocity and stress on social networks in Mexican communities following droughts and floods that led to an impoverishment of rural households heavily dependent on food production. Women were reported to be more affected than men since they were responsible for maintaining the networks through support and gift exchange and were more dependent on mutual assistance, including care support.

Heightened risks and uncertainty and imminent changes in socio-economic and political conditions can also compel individuals or entire households to migrate. Although migration is caused by a host of factors, including search for better economic opportunities, conflict, political violence and persecution, it has increasingly been an adaptive climate-related response. Adverse climatic conditions are leading to increased soil erosion, biodiversity loss, dry spells and water shortages, pest infestations, deforestations, wildfires and destruction of crops, making it harder to grow food (Bene and Devereux, 2023; FAO, 2023; Nico and Azzari, 2022). Climate change not only affects food production, but also has ripple effects throughout the value chains and food distribution systems and on its quality and access. Higher temperatures and prolonged exposure to high levels of CO₂ concentration could lead to losses in nutrient content of key food crops and increase the incidence of food-borne pathogens and mycotoxins (Moretti et al., 2010; Myers et al., 2024). This is particularly the case for those facing damaged or loss of livelihood, destruction of homes, businesses and essential services due to global warming and extreme weather events (Bartlett, 2008; Bhatta et al., 2015; Cattaneo and Peri, 2016).

The World Bank's Groundswell Report, for example, projected that climate change could force 216 million people to move within their countries by 2050 in order to avoid the slow onset impacts of climate change (Rigaud et al., 2018). Involuntary forced migration also occurs among people facing conflicts and fierce competition that may be a response to growing scarcity of water and arable land, for instance. A possible consequence of migration, whatever the reason, is the withdrawal of care support provided by the migrating extended kin, neighbours or friends, leading to a significant increase in the care workload of members of the households left behind. In the case of forced displacements, the traditional social networks existing in communities are disrupted entirely.¹

2.5 Concluding remarks

The world is already witnessing the grave consequences of climate change and transgressions of planetary boundaries. These involve not only more frequent heat waves, but also stronger storms and more intense flooding and droughts, reduced agricultural productivity, water crises and increased biodiversity loss. The above discussion illustrates the wide-ranging effects of

these climate hazards and stresses on the provisioning of care that sustains life, develops capabilities, reproduces societies and maintains the labour force. Such climate hazards include increased demand for care that results from injuries and disabilities, rises in water- and food-borne diseases, air pollution and allergies, vector-borne diseases such as cholera, dengue and malaria, and psychological and mental stresses. The abilities and well-being of caregivers, inputs for caregiving such as safe water, food and shelter, as well as access to care infrastructures and informal care support networks are seriously undermined both in the short and long run.

This demonstrates how the evolving gaps in care provision (care crisis) and the climate crisis are deeply intertwined. People need care throughout their lives in order to survive and to thrive. Yet, care is considered to be the “natural” responsibility of families, particularly women who provide much of it. The significant costs of heavy care workload include long working hours, chronic stress and foregone opportunities in education, employment and earnings, as well as civic and political participation. Without comprehensive public and global support for care provision and the integration of care in the climate agenda, the unmet care needs will only grow and inequalities will widen. Hence, getting care on to the gender-just transition agenda is vital.

There are compelling reasons to believe that solutions that effectively address unmet care needs can also help to mitigate the effects of climate change. Similarly, actions to meet carbon-zero goals, mitigate biodiversity loss and promote regeneration of our ecosystem can significantly reduce the care work burden that falls heavily on families, communities and women. Any effort to tackle these grave problems should be comprehensive in scope and must be based on principles of equality, universality and responsibility shared by all (Jodoin et al., 2021; Lozano, 2022).

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SECTION 3

Climate adaptation finance for care

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3.1 Introduction

The care economy is an important but unrecognised sector for climate change adaptation. Care involves not only infrastructure and quality services, such as childcare, long-term care facilities for the elderly and specialised services for those who depend on others to meet their needs, but also all the unpaid activity that takes place in families and communities (Addati et al., 2018). Deficits in care services and infrastructure can lead to lower life expectancy, chronic illness and poor quality of life (Addati et al., 2018, Chan and Kamala Devi, 2015; Ghosh, 2022). Conversely, care work enhances economic growth and affects the ability of women to participate in the paid labour force (Addati et al., 2018; Ilkkaracan 2018; Ilkkaracan and Kim, 2019). Care services provide global public goods, and their provisioning is the responsibility of society as a whole (Folbre et al., 2023).

The advent of climate change enhances the need for care services and a resilient care infrastructure. A growing literature documents the health effects of heat rise (Haines and Patz, 2004; Hondula et al., 2015), especially on young children (Xu et al., 2014) and the elderly (Worfolk, 2000). Deficits in care services lead women (and often children) to take on additional responsibilities, reducing their productivity and income-earning activity and stretching their working day (UN Women, 2023). Climate change damages care infrastructure: for instance, extreme weather events such as severe flooding and hurricanes, cyclones or typhoons impair care facilities, including hospitals, clinics, daycare centres, nursing homes and schools, and stop or disrupt their operations (Floro and Poyatzis, 2019).

Climate change also reduces access to important inputs for care, such as water, food and safe shelter.

3.2 The intersection of development and climate finance

To date, neither public finance in low- and middle-income countries nor development assistance to those countries sufficiently addresses care deficits. Moreover, finance for climate change adaptation completely ignores caregiving as a sector for adaptation planning. Yet, domestic resources, development assistance, and climate adaptation finance are all necessary to build robust care systems, in these countries.

Few countries invest in a universal and affordable quality care system that works across the life cycle for care of children, the elderly and those who need care for other reasons.¹ Estimates of expenditures for care vary widely, and different studies use different parameters for what is included in the universe for costing.² The most robust estimates for early childhood care and education (ECCE) suggest that government expenditures range from about 1% of gross domestic product (GDP) in some high-income countries to up to 14% of GDP in Tanzania, for instance (Borrowman et al., 2022). Estimating international development assistance for childcare is difficult, as there is no marker for tracking childcare in the donor database maintained by the Organisation for Economic Co-operation and Development's (OECD) Development Assistance Committee (OECD-DAC), although aid for early childhood education is captured for some regions. Estimates of long-term care for the elderly and those with disabilities are similarly patchy. For example, Borrowman et al. (2022) report that in sub-Saharan Africa, the Arab States and lower-income Asian countries, domestic financing for long-term care is close to zero, and donor programmes for these services are even more limited than those for childcare. It should be noted that these estimates should be seen as indicative, given large gaps in data coverage.

Analysis of climate finance reveals that the care sector is missing in country and global estimates, although some sectors that are included in cost estimates support some forms of caregiving. Given the issues noted earlier, care should be elevated as an important sector in its own right for climate adaptation finance.³

The IPCC (2022: 2898) defines adaptation as “the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities”. Estimates of the costs of adaptation for developing countries up to 2030 range from \$215 billion per year to \$387 billion per year, depending on the method used (UNEP, 2023). The highest adaptation costs are for river flood protection, physical infrastructure, and coastal protection.⁴ Financial flows for adaptation activities are far less than the needs. According to the Climate Policy Initiative (Wignarajah et al., 2023), adaptation finance accounted for just \$63 billion in the period 2021–2022, 89% or \$56 billion of which was for adaptation in developing countries specifically.

Globally, two sectors absorb the largest share of adaptation finance: agriculture, forestry and fishing, which represents about 20% of total adaptation finance and water supply and sanitation, which represents around 19% (UNEP, 2023). In recent years, adaptation finance has expanded to education, health, social protection, financial services, and research and innovation for adaptation solutions.⁵ Nonetheless, financing for adaptation in health and education is very low (4% for health and 2% for education). Including health and education represents progress since some of the actions in these sectors support caregiving, but flows are still insufficient.

Financing for climate adaptation comes from multiple sources, including domestic resources, international assistance and the private sector. Estimating the flows from these various sources is challenging due to widespread data gaps and methodological limitations. This makes comparisons across countries especially difficult. Nonetheless, based on an analysis of 24 national studies that assessed domestic climate expenditure, the UNFCCC Adaptation Committee (2022) noted that only 14 countries reported on adaptation expenditure. Of these, government expenditure ranged from 0.2% to 5% between 2021 and 2022, equivalent to 0.1% to 3% of GDP on adaptation (UNEP, 2023: 55, UNFCCC Adaptation Committee, 2022: 26). International assistance for adaptation totaled \$21.3 billion in 2021⁶ (UNEP, 2023), and private finance was in the range of \$1539 million⁷ between 2021 and 2022 (Wignarajah et al., 2023).

There is growing recognition that climate finance should be directed to the local level (Coger et al. 2022; UNEP, 2023), where adaptation activities are largely centred. However, local areas face a shortage of resources for basic needs such as adequate shelter and public transportation, let alone climate adaptation. Soanes et al. (2017) find that, across all climate finance, less than 10% of climate finance is committed at this level; a more recent update by UNEP (2023) finds a modest increase to 17% from 2017 to 2021. National governments can do more to devolve adaptation finance to vulnerable municipalities and urban areas.

Financing for care also needs to be directed to cities and municipalities, as care for children, the elderly and other dependents is inherently a local level activity (Addati et al., 2022). Few cities, however, have estimated the costs of a universal care system and they do not have the means to finance one. An important first step is for local governments to map out their existing care infrastructure and then build in the costs of moving towards a system that is climate resilient.

National and local governments can do more to support the establishment of robust and resilient care systems to deal with climate hazards. A “big push” for public finance and investment requires strong state capacity and coordinated approaches using various policy tools, including fiscal policy that links revenue stability and public expenditure design, inter-governmental transfers, and fiscal transfers to sub-national areas. More robust tools are needed to monitor the impact of public climate and development finance within countries. New initiatives are being developed to link climate and gender budget tracking, but these need to move beyond simple tagging exercises to monitor not just the quantity and quality of flows but most importantly, whether the finance is making a difference at the local level and for the people whose needs are greatest. Finally, an important challenge for future methodological work on climate adaptation and care finance is to account for the synergies and multiplier effects that are potentially possible across sectors. While this is an issue for all types of costing efforts, it is an especially important task in a constrained overall financing environment, where the same finance can support multiple objectives benefiting both care and climate resilience.

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SECTION 4

Policy challenges in the care-climate nexus: Lessons from Brazil

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In recent years, the intersection between climate change and social justice has gained increasing attention in economic policy discussions. Feminist economists, especially when analysing macroeconomic policies, frequently encounter tensions between economic, social and sustainability objectives. These challenges are particularly pronounced in countries other than the United States and European nations.

The interconnection between the climate and care crisis has been theorised by Fraser (2023). According to the author, the care and climate crises are deeply interwoven, both being intrinsic to capitalism. The accumulation process incentivises the expropriation of labour, such as unpaid reproductive work, and the exploitation of nature. Consequently, there is an inherent crisis that creates a contradiction between short-term profit extraction and long-term sustainability of the system.

From a macroeconomic perspective, the exclusion of reproductive and environmental spheres from the analysis of the functioning of the productive sphere of the economy has resulted in the formulation of policies that fail to address these crises adequately. For example, GDP calculations omit the depletion of natural resources and unpaid care work, thereby exacerbating these crises rather than mitigating them (UN Women, 2023).

Macroeconomic modelling traditionally isolates these dimensions, resulting in fragmented solutions. Some economists focus on addressing economic inequality or gender inequity, while others prioritise policies for green growth. However, these issues cannot be effectively tackled in isolation. The care and climate crises reinforce each other. For example, climate change strains access to water, food, healthcare and social infrastructure, disproportionately affecting already vulnerable communities (Valodia et al., 2024). Simultaneously, the care crisis impedes climate resilience, as time-intensive sustainability practices – such as organic agriculture, recycling and reforestation – become increasingly difficult for those bearing the burden of unpaid care work (Valodia et al., 2024). Neglecting these interdependencies in policy formulation leads to incomplete and ineffective solutions.

Moreover, nationalistic approaches to economic policy disregard the global nature of these crises. Country-specific policies ignore their effect on other economies. Historically, economic growth in developed countries came at a cost to African and Latin American continents. We cannot disassociate the racialisation of populations around the globe from the wealth and access to multiple resources of others. And although progressive economists can recognise these facts, they often hope that advancing sustainable growth will inherently contribute to gender and racial equality. However, that wishful thinking has not always been reflected because the contradictions between progressive agendas across nations can be observed, for example, on the fact that Europe advancements towards their green transition depends on mineral extraction in Latin America. Or, on the fact that the entry of many global North women into the labour market has been subsidised by migrant care workers from the global South. Is it that “greener” and “gender equal” national economies are to renew colonial relations?

If growth-enhancing policies in some countries occur at the expense of greater inequality elsewhere, then these policies risk perpetuating global disparities rather than alleviating them.

A more rigorous and inclusive approach to economic policy is required – one that acknowledges these contradictions rather than obscuring them. Latin American macroeconomists are trained to analyse their economies in relation to global power structures, whereas economists in Europe and the US often have the privilege of ignoring these dynamics. However, carbon emissions cannot be meaningfully accounted for within national borders alone, just as social impacts must be assessed on a global scale (SEEG, n.d.).

4.1 Caring economies and fiscal constraints

Given the contradictions between climate and care goals in policies, economists have been pointing to the necessity of building caring economies and effectively increasing public investment in care systems. Investment in care infrastructure is widely endorsed as a policy solution and is supported by both feminist advocates and international financial institutions (ILO, n.d.; Valodia et al., 2025). This approach alleviates the care burden, generates employment in a highly feminised sector, and increases women’s incomes. In addition, care sectors exhibit higher multiplier effects when compared to physical infrastructure investments, making them appealing even to policy makers solely focused on economic growth.

While this argument may be effective in increasing expenditure on care in high-income nations that face relatively flexible fiscal constraints, it presents challenges in countries such as Brazil that have implemented constitutional spending caps (Made-FEA/USP, n.d). Here, income is highly concentrated, with the top 10% appropriating half of the nation’s income, and a large proportion of the population earning below the minimum wage, which limits the capacity of the state to collect revenue through income taxation (Made-FEA/USP, 2024). The ability of European countries to sustain a welfare state is underpinned by their relatively high GDP per capita and lower inequality – both of which cannot be decoupled from the colonial exploitation of African and Latin American economies. This highlights the importance of achieving international cooperation on fiscal policies and building a democratic tax governance through the participation of global South countries in the negotiations (INESC, 2024).

4.2 Care crisis in Brazil

In Brazil, the care crisis is often addressed at the expense of marginalised populations. Nearly one-fifth of employed Black women work as domestic labourers, and account for 61% of all domestic workers in the country. Their employment is predominantly informal, with 75% lacking labour protections. This results in long-term precarity, as individuals who have spent their lives providing care find themselves without support in old age. In this context, racism and sexism function as structural mechanisms for managing the care crisis.

4.3 Climate crisis in the global North

The prevailing climate solutions proposed by the global North frame the crisis primarily as an energy issue, disregarding the realities of countries such as Brazil. The emphasis on renewable energy and electric vehicles overlooks the primary driver of Brazil's emissions. In 2022, land use change and forests accounted for 53% of the country's total emissions, when adding the agriculture sector, this equates to up to 77% (SEEG, n.d.). Global demand for agricultural products continues to incentivise deforestation, demonstrating that mitigation efforts cannot rely solely on technological fixes such as renewable energy.

For Brazil, effective climate policy must prioritise the halting of deforestation and must address the immediate impacts of climate change, such as extreme weather events including the recent floods in Rio Grande do Sul. However, the country's ongoing austerity measures severely constrain its ability to implement necessary adaptation policies (Made-FEA/USP, n.d.).

4.4 How academics and policy makers should approach this issue

Academic institutions, particularly in the global North, have a responsibility to acknowledge the impact of their research on the global South. In an era of evidence-based policymaking, researchers must recognise that empirical studies based on US and OECD country data are case studies – not universal blueprints (UN Women, 2023). This distinction is crucial, as simplistic policy prescriptions, such as transitioning Brazil's vehicle fleet to electric cars, require rigorous scrutiny.

Beyond merely echoing the research of global South scholars, global North academics must actively challenge the policies enacted in their own countries that shape economic and environmental conditions elsewhere. When the US raises interest rates to combat inflation, for instance, it affects inequality, not only domestically but also globally. Similarly, policies promoting electric vehicle adoption without addressing their extractive implications deepen economic and environmental injustices in Latin America. Scholars in the global North must take responsibility for exposing these dynamics rather than leaving that burden solely to affected regions (Valodia et al., 2024).

Heterodox economists, in particular, must engage with complexity rather than shy away from contradictions. Acknowledging and addressing these contradictions is essential to enacting meaningful change. If economic research fails to recognise the persistence of racialised and colonial economic structures, it risks generating solutions that either prove ineffective or serve only to reinforce these inequalities. Building caring and climate-resilient societies worldwide should be the ultimate goal of economic policies and should not be used as a justification for some countries to pursue growth at the expense of others.

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SECTION 5

Putting reproductive labour at the centre of the just transition

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Amid the global climate crisis, the enactment of an energy transition remains a fundamental policy for mitigating climate change worldwide under the COP21 Paris Agreement. As the current energy transition is hailed as a win-win solution against dirty economic systems and promising new green jobs while sustaining continual growth, a crucial question arises: how different is this energy transition from previous systems of social segregation, labour exploitation, wealth accumulation and harmful environmental practices of the past?

5.1 A just transition globally

Today's energy transition has been called upon not only to be urgent but also just. The call for a just transition originated from labour movements demanding responsible solutions to communities' social and environmental struggles, particularly for workers with high stakes in greenhouse-gas-intensive sectors. These workers seek secure job opportunities in low-carbon industries while addressing the urgent need to combat climate change.

Just transitions aim to safeguard working conditions, livelihoods, and economic and social rights of workers in industrial sectors, a long-term commitment supported by the International Labour Organization ILO (2015). Thus, taking this mandate to a global scale, a global just transition emphasises the importance of urgent actions while recognising the *common but differentiated responsibilities* between regions and societies undertaking the energy shift and those affected by it.

While debates around just transitions have considerably increased concerning energy democracy, participation, phasing-out and new technologies, climate initiatives still place insufficient attention on the intertwined nature of labour regimes, resource extraction and the entrenched neocolonial endeavours. Land, workers and raw materials located in resource-rich regions will be essential to the realisation of transitions everywhere in the world and these regions continue to face high levels of inequality and the largest consequence of climate change. Thus, climate action must consider policies that commit to ending historical inequalities rooted in the international division of labour, and they must align with climate justice calls.

The shift to low-carbon economy risks exacerbates pollution, environmental destruction and dispossession, leading to the formation of what is considered sacrifice zones, both in

marginalised peripheries of the Global South and North (Zografos and Robbins, 2020). Indeed, the energy transition relies heavily on mining of critical raw minerals for green technologies, which often comes at the expense of human exploitation and nature extraction. According to the International Energy Agency (2021), clean energy technologies will require a significant demand: over 40% for copper, between 60% and 70% for nickel and cobalt, and almost 90% for lithium in a scenario of low-carbon power generation by 2040.

This increasing demand for critical minerals will lead to aggressive expansion and intensification of the extractive frontier, transnational trade and manufacturing facilities over the coming years, raising concerns about the social and environmental justice impacts in the regions where these sectors are located. Dissecting the implications for feminist, social and environmental justice is of utmost concern because of substantial evidence that the extractive and trade industries have significantly caused environmental disasters, land dispossession and social marginalisation. Also, these industries are repeated offenders of human rights. These concerns extend beyond extraction sites to exportation hubs, processing plants and manufacturing centres of supply value chains.

Looking at labour regimes more closely, supply chains rely on underpaid, unskilled workers – often poor, racialised women and migrants, whose exploited bodies bear the brunt of the energy transition. While doing so, the energy transition in industrialised rich societies is also benefiting from essential reproductive and care work, which is largely invisibilised. That is, reproductive and care work largely subsidise the worker living conditions that make the energy transition financially profitable within the capitalist system of accumulation.

5.2 Energy transition and social reproduction

The call for a just transition has focused on formal labour and job security, overlooking the reproductive labour that subsidises these transitions. In fact, the energy transition is often portrayed as dominated by a male workforce in industries such as large-scale mining, processing and the manufacturing of electric batteries. If any, gender-based concerns for these industries have focused on equal job opportunities and have put the finger on increasing women participation in the workforce. Yet, are these economies truly running on male and formal labour alone?

To the contrary, these economies are underpinned by a highly stratified gender division of labour. Social reproduction theory puts a feminist lens on the economy to ask who upholds the living conditions for workers to continue their labour. It is reproductive care labour. This is not a revelation; the Covid-19 pandemic illustrated the centrality of caring economies as fundamental pillars for the reproduction of society at large. Any economic system depends heavily on the reproductive labour of poor women, who have historically taken on the responsibility of the life reproduction of people, including workers.

The energy transition, and its associated industries, also do so, and the conditions in which reproductive labour takes place particularly aggravate egregious formal labour conditions. Labour regimes of the extractive sector in resource-rich countries are highly precarious. Artisanal miners in many resource-rich countries frequently combine and switch between subsistence economies, supported by reproductive labour at the household and community levels. In fact, the mining industrial system is maintained through various networks of labour

interdependence with other subsistence economies. According to the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (2017), around 40 million people contribute to artisanal and small-scale mining worldwide and 150 million people are indirectly connected to it. From it, around 50% of the global artisanal and small-scale mining workforce is conducted by women.

Industrial mining tends to rely on artisanal or small-scale miners as the industry is eventually becoming unprofitable (Vela-Almeida and Karlsen, 2023). Artisanal and small-scale miners engage in petty commodity production and sell the material extracted through formal subsumption of labour. This relation removes all well-being responsibility from the industry, who outsources the costs, risks and environmental liabilities to small-scale and artisanal miners. In such contexts, largely invisibilised and trivialised networks of labour organisation at the outskirts of the market economy play a crucial role in sustaining the global supply of minerals.

While large-scale mining industries are increasingly automating and investing in high-technologies, often reducing the number of paid workers, these industries are expanding the number of workers involved in reproductive labour (Arboleda, 2020). Generally, poor, uneducated, racialised workers come to mining regions seeking job opportunities. They establish settlements without established support networks or rooted bondage. In such circumstances, they must outsource the conditions for their social reproduction. For that, the unpaid or unrecognised, often female, labour in essential economies such as street vending, cleaning, food production, health caretakers and emotional care become fundamental forms of reproductive labour that supports the industrial workforce (Lochery et al., 2024). This process has led to rapid changes in both the environmental and economic landscapes in extraction sites. It has also been associated with a rise in prostitution and violence against women.

In Chile, for example, industrial mining is connected to the 2007 Subcontracting Law, which promotes temporary and transient services, eroding workers' bargaining power and labour rights. Mining workers often rely on outsourced food production, cleaning and accommodation services to private companies that supply those services, which workers have to pay for. This dynamic creates new frontiers of capital accumulation, where wages are captured to cover the conditions for life reproduction – such as dormitory rentals and paying for food and cleaning – as well as the lack of welfare benefits, leading to further processes of indebtedness for covering their social reproduction.

It becomes clear that a plurality of social relations outside the market economy compensate for the precarisation of the conditions of life inside the market economy (Vela-Almeida and Karlsen, 2023). This reproductive labour, which is highly precarious and often invisible, is vital to sustaining the energy transition. However, the just transition debate fails to fully address the articulation of the out-of-market interdependencies that maintain processes of capital accumulation at a global scale. If the discussion ignores reproductive labour, what is “just” about the energy transition? An effective just transition goes beyond merely greening energy systems; it must put social reproduction at the centre of the transition.

5.3 The case of the European energy transition

The energy transition in Europe involves a comprehensive set of actions aiming at ensuring access to a secure, diversified, affordable and sustainable supply of critical raw materials. This is a big challenge for Europe, who became the leading regional bloc in committing to halving

emissions by 2030 and to target a net-zero carbon economy by 2050. In December 2019, the European Union (EU) launched the EU Green Deal (EGD_ that proposed a series of policies to transition towards greener EU economies.

To meet these objectives, the EU Critical Raw Materials Act came into force in May 2024, seeking to secure a sustainable and affordable supply of critical raw materials globally. This regulation is important because Europe relies on imports for more than 90% of its critical raw material supplies, often from quasi-monopolistic third-country suppliers. To reduce this dependency, Europe is consolidating its strategic partnerships with resource-rich regions such as Asia, Africa and Latin America.

This is a critical moment to question whether one of the fundamental premises of the EU energy transition –“leaving no one behind”– really upholds beyond the EU borders. Currently, the EU Critical Raw Materials Act does not account for the embodied neocolonial and capitalistic forces that are leading the expansion of the extractive frontiers into more marginal lands, encroaching new ore deposits and contested lands. These constitute large red flags that the just transition debate in Europe is largely omitting.

The extraction of minerals from nature, alongside the extraction of labour from human bodies, in the production of green technology is an intrinsic feature of green capitalism (Arboleda, 2020). Therefore, it is crucial to examine whether true sustainability for this green transition can be achieved on a global scale and whether it can deliver justice that ensures fair and equitable opportunities for marginalised groups, improves their well-being and minimises the expansion of sacrifice zones.

Having a feminist critical engagement with green deals, Cohn and Duncanson (2023) argue that different feminist questions lead to different policy responses and, consequently, different potentials for transformative impact. Taking this into consideration, an effective just transition must prioritise care, well-being and a critical interrogation of the structural basis of the energy transition globally.

The concept of a global just transition offers an ambitious mandate to combat climate change worldwide. Thus, it needs to put emphasis on global forms of reproductive labour exploitation that exist in historical and ongoing systems of global distribution of value to ensure that planetary, feminist, social and environmental justice is made a priority for everybody. A concomitant examination of what occurs in the regions supplying critical materials is essential, as the energy transition in industrialised societies will have significant implications far beyond their national borders.

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SECTION 6

Saviours and victims: Gender inequalities in the care-climate change nexus

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This brief note focuses on gender inequality as a central aspect of the care-climate nexus. It argues for the need to move away from essentialised conceptualisations of gender in the context of climate change in favour of a more grounded understanding that pays attention to questions of structure and agency in different contexts. Certain tropes about women have had an enduring popularity in the literature on gender and development (Cornwall et al.). They have also resurfaced in the literature on gender and climate change. Arora-Jonsson (2011) draws on the dual themes of “virtue” and “vulnerability” to capture a version of these tropes. Comparing the literature on a “northern” country (Sweden) and a “southern” one (India), she finds that “vulnerability” tends to dominate discourses about women in the Global South in that they are seen to be more vulnerable to climate change than men. “Virtue” is associated with women in the North who are represented as more responsible about the environment than men and more responsive to the need for behavioural change. In both cases, she points out, questions of power that might differentiate the responses of men and women in different contexts are ignored.

A similar, but differently worded, dualism that has been carried over from the literature on gender and development into discourses about gender and climate change is that of saviour/victim (Leach et al., 2015). The depiction of women as saviours is a variation on the theme of virtue – the idea that women are closer to the natural environment and more protective of it. The victim discourse stresses their greater vulnerability to the harms of climate change than men and their lesser ability to cope. Once again, questions of power and what they imply for gender and agency are ignored. This contribution uses evidence on care, well-being and livelihoods, drawn largely from the Global South, to unpack these tropes, to consider what underlies them and to argue for a framing of gender, care and climate change that can accommodate the complex realities of the real world in which climate change is occurring.

6.1 Women as saviours

An important component of the “saviour” discourse within the development literature rests on women’s role in care activities. From a care and well-being perspective, it is certainly the case

that, regardless of significant variations in context and culture, women and girls in the Global South (and in much of the world) bear disproportionate responsibility for the unpaid work that goes into reproducing life, labour and well-being on a daily and intergenerational perspective. These inequalities in unpaid reproductive work within the domestic domain, rooted in the long-standing structures of patriarchy that characterise different contexts, generate systematic inequalities in the terms on which men and women are able to participate in activities in the public domain – including, of course, activities in the paid economy.

However, an intersectional approach is necessary to assess how these inequalities play out among groups who are differentiated by class, caste, race, ethnicity and so on. Across the world, women from the more affluent classes are able to hire those from poorer households and marginalised social groups to take on much of their unpaid responsibilities, thereby enabling them to participate more actively in the public domain of the economy, society and politics.

This is not the case for all women, and it is certainly not the case for poor women in poor countries. For these women, unpaid reproductive labour extends well beyond what is conventionally described as “care” in the Global North. It includes “cooking” but cooking can entail going long distances to fetch fuel and water or waiting in long queues to purchase these necessities. It includes “cleaning” but without the help of domestic technologies, such as dishwashers, vacuum cleaners and washing machines; the tasks associated with cleaning are far more time consuming and burdensome and likely to include additional work such as maintaining the household structure itself, replastering mud walls and repairing the roof. And it includes “caring” for all family members, particularly those who cannot care for themselves, but it has to be done for the most part without access to supportive public services, such as education, health and social care.

In addition, and unlike most women in the Global North, poor women in poor countries undertake a range of unpaid productive activities intended for their family’s own consumption. Hence, a central component of their reproductive responsibilities is rarely included in estimates of the labour force. Common examples include rearing of livestock and poultry, homestead cultivation, and, particularly among indigenous groups, harvesting of forest produce.

These unpaid reproductive responsibilities curtail women’s ability to take up paid work as well as the kinds of paid work that they can undertake. It explains why the gender gap in labour force is highest in those years of their lives where their childcare responsibilities are likely to be greatest – also the years where their capacity for productive labour is greatest. It is also an important explanation for the gender segregated nature of paid activities. Women are now more dependent on agriculture for their livelihoods than men. This feminisation of agriculture reflects the mechanisation of agriculture, the concomitant drop in the demand for agriculture labour and men’s greater ability to migrate in search of opportunities elsewhere. Women are also to be found in labour-intensive small-scale enterprises, most often carried out in or near the home, and in activities, often poorly paid, that represent the extension of their sexual and reproductive roles into the paid economy – domestics, community-based health workers, sex workers and so on. However, one important finding that emerges from studies on women’s paid activities is that a great deal of their earnings are invested in the care and well-being of their families – in other words, paid work provides them with an alternative route to carrying out their care responsibilities.

Stepping back from these gender differences in roles and responsibilities in both paid and unpaid work, one generalisation we can make is that women and girls in the Global South are

likely to have the lightest carbon footprints. They are more likely than men to be found in forms of work that do not inflict major damage on the environment – and indeed may often help to preserve the environment. But before we label women as saviours, we need to reflect on the issue of agency that underlies this division of labour. To what extent do these activities reflect women's choice and preference and to what extent do they reflect their absence – and if they are some combination of both, how do we disentangle them? Do women take up a disproportionate share of unpaid care work or use their resources for the well-being of their families because of some biological predisposition, because it is their socially ascribed role, because they would face penalties or violence if they refused, because it makes economic sense for them to do it, given the patriarchal structures of the labour market or because it is what they want to do? Is women's farming less productive than farming by men, regardless of the size of their plots, because they choose to use fewer chemical inputs or because they cannot afford these inputs? Do indigenous women fight to protect the forests because they have a greater affinity with nature or because forests represent an important resource for their livelihoods? And do they rely on forests for their livelihoods because this is an essential part of their way of life or because they are excluded from the mainstream economy and society? We need to ask these questions because they are relevant for a gender-just transition to a more sustainable economy.

We need to also note that many of the activities that women take up as part of their livelihoods are not necessarily sustainable. In certain parts of the world, women play a major role in rearing of domestic animals that contribute to carbon emissions – larger livestock have been singled out in this regard. In addition, many of the global value chains in which women make up a disproportionate share – the global garment production for instance – has been identified not only as symbolic of the wasteful throwaway consumerism that has contributed to climate change but also as a direct contributor. And while extractive industries, major contributors to environmental damage, are largely male dominated, women working in them are at increased risk of attack, including sexual assault. These are jobs that are likely to be phased out in the transition to a cleaner and greener economy – but what will happen to the men and women who rely on them for a living?

The point of asking these questions is to both recognise the significance of care work as the foundation of the economy, whatever form this economy takes, and to challenge the notion that women are inherently more virtuous than men. Therefore, we need have no qualms about giving women responsibilities that require them to care for people and to save the planet, irrespective of what it means for their workloads, or berating them for undertaking forms of work that damage the environment. An alternative approach would be to ask whether we need to rethink how we organise production, reproduction and care in ways that reconcile climate justice with gender and economic justice.

6.2 Women as victims

The other side of the coin to the notion of women as saviours is that of women as victims, a notion that maps into ideas about their greater vulnerability in the face of climate change. But once again, there are reasons to avoid sweeping labels and to explore the questions of agency that lie behind such labelling. Victimhood implies helplessness in the face of adverse circumstance. It sees women as a homogenous group and ignores differences in their agency that reflect the intersection between gender and other forms of disadvantage, including those

associated with class, identity and location. An intersectional approach, conversely – one that is informed by history and context – tells us that the world's most disadvantaged groups, located largely in the Global South, are most adversely affected by climate change and least able to adapt in sustainable ways. But it also tells us that not all disadvantaged groups are equally affected and, of those affected, not all are equally helpless in the face of climate impacts. Gender is one of the key factors that differentiates impacts and responses.

Starting with the issue of care, an analysis of 130 peer-reviewed studies found that 89 reported that women were more affected than men by health impacts associated with climate change – they were more likely to die in heatwaves and tropical cyclones, and more likely to suffer poor mental health, partner violence and food insecurity in the aftermath of extreme weather events. But in certain contexts, men faced higher risks – of suicide following extreme weather events and health issues associated with working the kind of work they do. Some of these gender differences in impacts reflect differences in the circumstances of everyday life. For instance, women may be more exposed to harm through cooking practices while men may be more exposed through their role in farming and greater exposure to pesticides.

Environmental factors also have gender-differentiated impact on reproductive health. Research has shown that climate change and air pollution have a different impact on women's health and well-being due to several specific vulnerabilities related to their physiological and reproductive systems (Van Daalen et al., 2020). Evidence from a number of countries associated with the Organization for Economic Cooperation and Development (OECD) has shown that expectant mothers who have experienced foetal exposure to extreme temperatures are more likely to report low birth weight babies, increased neo-natal stress and reduced gestational age.

At the same time, environmental factors also have an impact on male reproductive capacity. A review of global trends in sperm count by Levine et al. (2022) found that sperm counts fell on average by 1.2% a year between 1973 and 2018, from 104 to 49 million/ml. Since 2000, the rate of decline has accelerated to more than 2.6% a year. While both lifestyle and environmental factors have played a role in sperm counts and male infertility, lifestyle changes may no longer be sufficient as evidence mounts of a wider environmental threat: toxic pollutants. Increasing temperature also been found to affect male fertility, with heat waves damaging sperm in both animals and humans.

Gender-differentiated vulnerabilities to climate change reflect differences in livelihood responsibilities. As the 2023 Lancet Report notes, heat exposure led to the loss of 490 billion potential labour hours in 2022, a 42% increase from 1991 to 2000. Of those who experienced losses higher than the global average of 143 hours, 80% were from countries with a low / medium human development index (HDI) while 87% of those experiencing losses lower than the global average lived in high or very high HDI countries. The groups most affected by heat-related health and labour capacity loss were working age, outdoor workers. Men were over-represented in this group, but it should be noted that unpaid labour, to which women dedicate more time, was not accounted for in these figures. Also less likely to be counted in these kinds of studies are the informal forms of paid work in which women are over-represented: these not only tend to be lower paid but also at greater risk during climate shocks and in the transition to a net zero economy (UK-AID).

In as much as women are primarily responsible for unpaid reproductive activities within the family, health risks to family members add to their reproductive responsibilities. It has been estimated that they undertake an extra hour a day to care for those with climate-related illness in

the family (Smith et al., 2021). The destruction of health infrastructure and emergency response systems that often occurs during disasters adds further to women's care burdens (Baek, 2022; Floro and Poyatzis, 2019).

Beyond their impacts on the health of men and women in the family, the impact of climate change is mediated by gendered livelihood patterns. Women's greater reliance on agriculture for subsistence or employment and their greater responsibility for household water and fuel provision means that they are most affected in the face of land degradation, deforestation, water scarcity, and pollution – widespread manifestations of climate change.

Turning now to the other aspect of victimhood, the gendered nature of women's vulnerability places limits on the kinds of agency they are able to exercise in the face of climate-related impacts. Such limits explain why, particularly among poorer women, responses generally increase demands on their time and energy in both paid and unpaid work. As climate change reduces the availability of natural resources, such as trees, timber, firewood and water, the time women spend on key care activities has increased by up to four hours daily. Bull et al. (2020) found that many women in their Pakistan study had to walk longer distances twice a day to collect water and fodder. The time involved could add up to eight hours a day. In Myanmar, women engaged in physically demanding labour to feed their families under increasingly difficult conditions: they had to remove sand from rice by sifting it through small fishing nets, cope with polluted water through bamboo or plastic sheeting or handmade zinc drains, or travel to a town where they hoped to queue at water trucks to get clean water (Baek, 2022).

Responses to climate emergencies, such as those caused by desertification, can amplify discrimination already experienced by young women and girls. Evidence from Bangladesh, Uganda and Malawi all show that where climate change leads to food scarcity, parents in farming families are marrying off their daughters at earlier ages in order to lessen the burden of feeding the family. Research from Uganda found that during periods of prolonged drought in which women and girls are required to make more frequent and longer trips to obtain food and water, their vulnerability to sexual assault is also increased.

But there are other more active forms of agency demonstrated by women in the face of climate change that do not rely on reinforcement and intensification of their gender-based disadvantage. Indeed, the fact that women have often played a central role in movements that sought to resist environmental destruction, such as the 1974 Chipko movement in India and the 1977 Green Belt Movement in Kenya, has been partly responsible for the essentialist linkages between women and nature that underpin some of the saviour narrative, even though a major motivating force was the effort to meet basic needs and protect livelihoods (Leach et al., 2015). There are similar actions at the grassroots level that are less well known but motivated by the same concerns about the link between natural resources and livelihoods. In our study of the Gond community, an indigenous group in India, we found that women self-help groups led the resistance to illegal logging by commercial companies in their efforts to save the forests (Kabeer et al., 2023). Such defiance is not necessarily safe. Legal attacks on environmental activists are generally linked to the exploitation of natural resources, with logging among the most common. Women and indigenous people are among those most frequently killed (Hines, 2022).

Nevertheless, as the destructive effects of a market-driven growth paradigm become increasingly obvious, we are finding that women from various walks of life – young and old – are taking action to fight for a more just and sustainable way of life. They are persistently excluded from the major forums where discussions about climate change take place – COP26 is an example – but they

lead grassroots activism for climate change with gender justice. The experience of intersectional disadvantage remains a driving force, and not only in the Global South. Dominique Palmer, a young black woman from London, became an environmental activist when it became clear that health risks as a result of exposure to air pollution were disproportionately high among members of ethnic minority communities. As a member of the UN Women's Feminist Coalition for Climate Justice, she pointed out: Women are not necessarily intrinsically guardians of the earth, but gender inequality has forced them to bear the brunt of the climate crisis by dealing with extreme weather events and food scarcity head-on, more so than men as a result of resource allocation, labour divisions, and representation and power in decision-making spaces.

What then is the key message that emerges from these reflections? Economic growth in the current era is dependent on unpaid care largely provided by women and girls across the world. Their primary responsibility for this largely unacknowledged work plays an important role in creating and upholding gender inequalities in life choices and life chances – the various manifestations of gender injustice we see in the world today. Care work will remain indispensable in the transition to a more sustainable economy and in whatever form this economy takes. The challenge we face relates once again to the questions we asked earlier. Will we continue to assign primary responsibility to women and girls, and reproduce the gender injustices that characterise the world today? Or do we need to rethink how to organise production, reproduction and care in ways that reconcile climate justice with gender and economic justice?

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SECTION 7

In search of new economic thinking

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Extreme levels of inequality, widespread joblessness and insecurity, large-scale environmental disasters and the rise of right-wing movements and governments all over the world are a clarion call for the rethinking of economics and economic policy. The citizenry feels left behind, impoverished, unvoiced and is now seeking its redress in ethno-nationalist strongmen.

The dominant approaches to economic policy focus on a handful of narrow goals, such as the growth of gross domestic product (GDP) or inflation rate suppression. The use of GDP since the late 1940s as the primary measure to understand the health of an economy has been critiqued extensively. For starters, we need to more precisely understand the broad impact of macroeconomic policies, which takes into account paid, unpaid and non-market work; none of which are accounted for in the standard economic variables employed by mainstream economics. Mainstream policies do not see the increase in unpaid care work in terms of GDP, despite its huge impact on GDP and especially during crisis. According to the International Labour Organization (ILO), based on time-use survey data in 64 countries, an estimated 16.4 billion hours are spent on unpaid care work every day – this is equivalent to two billion people working eight hours per day with no remuneration. If unpaid care work was valued on the basis of an hourly minimum wage, this would amount to 9% of global GDP, which corresponds to USD 11 trillion (Ward, 2022).

The economic growth paradigm is also ill suited to evaluate macro-level improvements to well-being. Although growth in GDP can be a useful measure of economic activity, growth itself does not necessarily translate into better outcomes in terms of poverty, health or jobs. In reality, GDP growth can frequently worsen health status, pollute the environment and reduce leisure time. There are positive factors that contribute to well-being that are excluded from GDP, such as health status and life expectancy, levels of access to education, a clean, sustainable environment, unpaid care work, the value of leisure time and the problems arising from growing inequality around the world.

Reflective of this realisation, many countries are now starting to give well-being indicators a central role in judging how well the economy is doing. The Organization for Economic Cooperation and Development (OECD) countries, such as New Zealand, have been looking at well-being, where societal progress is measured by the improvements in the well-being of people and households (The Treasury – Te Tai Ōhanga 2022).

An important way to decentre growth is to look at the human rights approach. This approach provides a normative framework for evaluating economic policies and assessing their outcomes. It represents an alternative to the ethical foundation of the dominant theoretical framework in economics – neoclassical economics – and is based on the ability of individuals to make choices that maximise their own individual happiness or satisfaction, termed “utility”. If we were to argue that the purpose of the economy was to fulfil rights, we would have a very different set of policy priorities, especially in macroeconomic policy making. So, if substantive equality is the metric by which to evaluate the economy, equality is about equality of outcome, the right to leisure, the right to an adequate standard of living, the right to housing, education and health. Accountability, transparency and participation in economic policy making is a human rights obligation that eventually allows for a more democratic process of economic policy making.

Human rights are also clear about the central role of the state as the ultimate duty bearer for fulfilling human rights. The human rights approach allows for a complex interaction between individual rights, collective rights and collective action. It sees policy as a social and political process that should conform to human rights standards, not a purely technocratic exercise. Instead of prioritising a single institutional approach (e.g. free markets), the human rights approach allows for institutional pluralism. It incorporates an understanding of the paradoxical character of governments, recognising that states can both enable and deny social justice, and that individuals need protection against misuse of state power, as well as requiring the power of the state to be harnessed to realise their rights.

The human rights framework compels us to move beyond a narrow focus on GDP or income when evaluating economic outcomes. Instead, the human rights framework stresses the progressive realisation of economic and social rights over time. The idea of progressive realisation replaces GDP growth as the measure of social progress. Advances in social justice are achieved when the enjoyment of the rights to an adequate standard of living, education, health, work and social security, among other factors, improves over time (Balakrishnan, Heintz and Elson, 2016).

Various aspects of the human rights framework can be used to evaluate and assess economic policies and their outcomes. These include the obligations to respect, fulfil and protect, the obligations of conduct and result, and the principles of progressive realisation, non-retrogression, maximum of available resources, non-discrimination and equality, minimum core obligations, and accountability, participation and transparency.

Many of these human rights aspects are implicitly incorporated into the well-being indicators but are not clearly articulated or stated. The measurement of well-being highlights inequalities and focuses on people and outcomes at the individual and household level, and allows for an analysis of inequalities. It asks to examine inequality between groups but the evaluative criteria it uses are not well articulated, especially in terms of gender equality.

Shifting the terrain of our discussion to the environment, a GDP-centric approach certainly fails to take sustainability into account at all, while mainstream economics examines environment costs as an externality. The larger question is whether economic growth is itself sustainable over time and whether growth can be achieved in a sustainable way. Although there is some attention to sustainability within the human rights framework (i.e. a clean healthy sustainable environment is integral to the full enjoyment of human rights), there needs to be a more robust understanding of this relationship beyond environmental crisis.

More recently, the OECD developed a series of indicators to measure well-being in many countries (OECD 2013). The 11 dimensions of well-being that are used by the OECD are income and wealth, work and job quality, housing, health, knowledge and skills, environmental quality, subjective well-being, safety, work-life balance, social connection and civil engagement. The key dimensions of resources for future well-being are natural capital, economic capital, human capital and social capital. While these reflect attempts at considering well-being, they are still very economic and capital oriented (OECD 2013).

An important part of the use of human rights norms is that the duty bearer is the state, but many decisions about economic policy are not under the jurisdiction of a particular state and are made by the international economic order. The current structure of the global economy creates a situation in which countries have significantly different policy options available to them (Ocampo and Vos, 2008). This differential in policy autonomy can reinforce existing inequalities that limit the realisation of economic and social rights. Coordination and cooperation between countries is required to address both these concerns – the unequal distribution of resources and inequalities regarding policy space. This raises challenging questions of how to develop a framework, consistent with human rights principles and obligations, that supports the realisation of rights globally.

One of the serious shortcomings of an approach that regards growth as the solution to economic crisis is that there are serious environmental limits and potentially catastrophic consequences of continued growth. Growth, whether inclusive or not, creates not only negative externalities, but also distributive outcomes when the environment is destroyed. The ecological limits of growth need to go beyond looking at the negative consequences of pollution to radically shifting how development is conceived (Satgar, 2018).

Ecuador, in particular, uses the concept of *Buen Vivir*, which is based on indigenous traditions and values of the Andean region. This departs from Western paradigms of affluence and growth and is predicated on the idea of harmony with oneself, the community and nature. These concepts are being used in drafting a new constitution, as well as an evaluative criterion to look at well-being (Aroca, 2020). Some of the language around *Buen Vivir* involves rights, such as the right to a good life and the rights of nature. The right to a good life includes the rights to nutrition, health, education and water, and uses the economic, social and cultural rights norms. *Buen Vivir* goes beyond these rights fulfilment to question the principles of modern development. It asks for a new model of the economy. *Buen Vivir* argues for a de-colonial model based on indigenous concepts of a good life and incorporates the human relation to nature. This philosophy or concept aims for harmony with nature and condemns the excessive exploitation of natural resources.

On the one hand, this conception of *Buen Vivir* is useful to examine a specific critique of current economic policy. On the other hand, the actual use of this paradigm has not produced new models. One issue is the scalability of the concept at the macro level, as well as the gender assumptions of indigenous traditions. *Buen Vivir* in Ecuador has been critiqued for failing to deliver a new paradigm and for its embrace of some of the same policies that were detrimental to the environment (Aroca, 2020).

If we are to address the roots of people's disenchantment, while averting ecological catastrophe, we must develop new approaches to economic policy. In this article, several paradigms have been

discussed as an alternative to growth as the evaluative mechanism for judging the health of an economy. Well-being, the human rights approach and Buen Vivir embody some new thinking that has great potential for alternative policy making and a new normative framework to truly understand and comprehend “what is the economy for?”. As discussed, each approach has its limitations but bringing them in conversation together gives the basis for new ways to approach the most basic of questions – What is the economy for? This can give life to a wider set of policy and institutional reforms, based on new frameworks and analysis, to achieve new social and economic goals. This requires a new conception of economic and social progress to inform economic policymaking and politics globally – a deeper understanding of the relationship between growth, human well-being and human rights. It requires a reduction in inequalities, in particular gender inequality, and ecological sustainability that goes beyond sustainable development.

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A shorter version of this paper was published as an op-ed on The Conversation [here](#).

SECTION 8

Care in environmental and climate governance

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Recognising the role of (often unacknowledged) care in environmental and climate governance is vital for ensuring a sustainable and just environment and climate transition. Drawing on Brush (2016), “care” in environmental and climate governance may be thought of in two ways. The first is through an analysis of the “gender of governance”, that is, the ways in which practices and assumptions of gender difference and dominance organise institutions, capacities and ideologies of climate governance and how care is central in that. Such an analysis is an acknowledgement that policies often depart from an androcentric bias while purporting to be universal or neutral. The second way to understand care in governance is related to Brush’s idea of the “governance of gender”, that is, how government bodies and social policies produce and police the boundaries between masculinity and femininity. I expand Brush’s view of the governance of gender as outlined above to also include attempts that may be progressive and seek to bring about a change in gender relations. Social policies that acknowledge care or gender mainstreaming fall under such an understanding of the governance of gender and care. It is mainly to this that I refer when I write about the governance of gender.

8.1

Care underpins gendered environmental and climate governance

Care work being carried out in environments and communities is central to making governance function in relation to both production and reproduction (see, for example, in relation to forests, Arora-Jonsson and Agren, 2019). A great deal of productive work that involves housekeeping of resources is carried out in environments and needs greater attention and recognition. This work, often by women and other marginalised groups, is seldom addressed in policies and environmental and climate practice and yet holds up the current system. Such work needs to be acknowledged and addressed in policymaking and in practice in the many development/environmental and climate projects that assume or build on this taken-for-granted work without acknowledging it. Women’s work on farms, for instance, both in the global North and South, goes unacknowledged when it comes to formal statistics. Men are predominantly listed as the landowners and the work done by women remains invisible. Sweden, for example, has started collecting statistics in new ways – although landownership remains skewed (see Arora-Jonsson, 2024).

A second aspect of the invisibility is the unpaid and acknowledged work of reproduction and care being carried out in environments and community spaces, now all the more acute in times of climate transition. Early feminists working on the environment (Cleaver, 1998; Fortmann and Nhira, 1992; Mies and Thomsen, 1999; Rocheleau, 1994; Shiva, 1989) highlighted the work of care that women do in environments and that remains unseen in official accounts and programmes, even today (for example, Graddy-Lovelace, 2018). In my previous work, I have shown that this work in the “in-between spaces” (between the planting of crops and homesteads such as on the edges of fields or in understories or organising events and taking care of community spaces) and “in-between times” of other chores in the household and fields, demonstrates the inextricability of care at home in the private sphere with what happens in the public sphere. Women, both in an individual capacity and in collectives, through their environmental work erase the boundaries of the public (work) and private (care) that climate and environmental politics seems unaware of (Arora-Jonsson, 2013: 221).

Beyond this productive and reproductive work in environments, reproductive work large underpins climate and environmental governance. Feminist economists have long highlighted how care work (especially that of women) in the home is inextricable from formal work, both in rural and urban settings (see Adatti et al., 2018). For example, this is clear in climate projects that advocate the inclusion of women’s work in markets as part of climate projects, but without acknowledging their many constraints (Westholm and Arora-Jonsson, 2015).

Women mobilise important knowledges and skills that lie beyond the existing frames of climate change adaptation and mitigation and they have much to offer for the care and repair needed for transitions (Carr, 2022). All such work and the blurring of the private and public that it entails needs acknowledgement in climate policies and projects and for climate justice. Gendered care work is thus central to environmental and climate governance and constitutes the gender of environmental and climate governance.

8.2 Governance of gendered care work in environmental and climate governance

To come to the second part of my argument – the governance of gender and care in relation to climate and environmental policy and practice. Here, I explore what attempts there have been for centring care work in environmental and climate governance.

The failure on the part of climate interventions all over the world to involve local communities, and especially women, in discussions on climate programmes and in addressing social differences that shape people’s livelihoods, decisions and outcomes, including but not limited to gender (see Carr et al., 2016; Sandstrom and Strapasson, 2017) have, on the whole, been repeating the failures of past environmental governance.

There has, however, been a growing commitment to making environmental and climate change interventions acknowledge the work of care, although this has certainly not been given predominant attention when climate projects start paying attention to gender. The chosen path has been involvement in markets and employment that has not led to a transformation of the inequitable structures in which women find themselves (see Chant, 2016). In climate programmes, co-benefits that accrue from wider climate strategies have been seen as the answer to gendered inequalities and little note is taken of reproductive work outside of markets

(Westholm and Arora-Jonsson 2015). Safeguards in such programmes have failed to change existing structures that acknowledge wider inequalities based on an invisibilisation of care (Acosta et al., 2019).

In a recent overview of the literature on care that we related to questions of climate change, Sherilyn MacGregor and I (MacGregor and Arora-Jonsson, 2022) found that there is a narrow understanding of care work as a problem for women (that is, care = drudgery) and possibly a lack of multidimensional, contextual and intersectional analyses of care work and its interactions with the impacts of climate change. This is not surprising. Even though feminist climate research includes analyses of social reproduction and the care economy, there are few specific and sustained examinations of care as a form of work in the grey literature on gender and climate change interventions; it is either absent or mentioned as one aspect of the plight of women. For example, in their “Strengthening gender considerations in adaptation planning and implementation in the least developed countries” report, the LEG (2015) does not discuss care work at all. Their review of the literature that zeroes in on the gender inequality–climate change nexus confirms that care work is rarely singled out for close, critical and multidimensional examination. They suggest the 5R1 approach to respond effectively to questions of care.

Evidence suggests that care-sensitive approaches may be more likely to be accepted by local people if benefits to the whole community are made evident, thereby avoiding the pitfalls of approaches that only target women (see Bryan et al., 2018). Thus far, care work is taken into account largely as an aspect (and cause) of women’s vulnerability. Our view was that care work and gender inequality should be treated as related rather than conflated.

Certain aspects stood out in relation to what we felt were positive examples and may be seen as an attempt at the governance of care – in its more progressive spirit. First, sharing and collectivising care work at the same time as delivering on adaptation and / or mitigation goals pointed to positive outcomes. This is also an insight from the community forestry programme run by FAO for several years, in which I was involved and where Marlyn Hoskins was one of the architects of the programme who deemed this conflation of everyday necessities and care with forestry programmes as one of the important reasons for its success across many countries.

8.3 Examples of gendered care work

Among the best examples today is the FUNDAECO project in Guatemala that combines forest conservation with the establishment of community maternal and sexual health care services (serving 50 000 people) run by indigenous midwives (WGC, 2020). Others are more modest in that they provide childcare to enable women’s participation, such as that mentioned in the SISAM solar irrigation project in West Africa (WGC, 2018). In addition to collectivising care work at the community level, some researchers and organisations explicitly mention the importance of increasing “labor-burden sharing” between men and women (Deering, 2019: 21).

A project aiming to build capacity for more resilient agricultural practices in Kenya had the added impact of fostering more equitable sharing of income among household members, including young people, which is reported to have led to increased harmony (Deering, 2019: 10). By placing a stronger focus on promising practices already shaping gender relations and care in specific places, change is possible (Njuki et al., 2016).

Another interesting example is that of the Solar Mamas Program initiated in India by the Barefoot College of Tilonia, Rajasthan, India. This programme now operates in more than 90 countries and is the result of partnerships between state agencies, non-governmental organisations and even private companies in some places (see Michael and Ahlborg, 2024). The programme trains women as solar engineers, preferably mothers who are often unable to leave their villages due to their care responsibilities. This is done through a long and inclusive process where a large part of the community is involved. It also involves training in being able to handle the public sphere but also where their care is acknowledged and where the care of energy infrastructure is embedded in their collective care work rather than in an approach that focusses on individual solar engineers. Others in the community are sought to be involved in the process.

8.4 Conclusion

Climate strategies today focus a great deal on the work of non-state actors. Women's groups internationally have also tried to call upon the responsibility of corporations to work towards justice. Private interests are most useful when they curb their exploitative practices. For example, climate programmes based on carbon trading have been rightfully criticised by many. However, given that private interests are considered central in climate action today and that carbon markets are dominant, it makes it important for feminist practitioners and academics to engage with them rather than ignore them. The W+ Standard put forward by the women's network WOCAN may be seen as one such attempt. The W+ standard is meant as a methodology that ensures that gendered inequalities, including women's often invisible care work, are accounted for in all carbon trading and development projects, by quantifying and certifying benefits for women involved in community development and climate projects. The hope is that corporations and businesses could be made to respond to the needs of local economies rather than the other way around (Arora-Jonsson and Gurung, 2023).

Clearly, there are many obstacles and such attempts should not be seen as a replacement for changing the structures themselves. But such attempts that bring the lived experiences of women and other marginalised groups into the work of environmental and climate governance and acknowledge the care work that underpins both productive and reproductive labour in the environments and communities, perhaps provide a means to begin to bridge the gap between new climate programmes and care work that underpins everyday environments.

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SECTION 9

Bringing environment and climate change into the care diamond

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9.1 Introduction

The disproportionate impacts of environmental degradation and climate change on women have been recognised for some time (see, for example, Arora-Jonsson, 2011; Lawson, 2007; Nelson et al., 2002), acknowledging that women carry much of the responsibility for managing households and that climate change can undermine this work. However, there has been relatively little direct attention given to the intersections between climate change and unpaid care. Care ethics, as described in Lawson (2007) and Tronto (2013), are rooted in an understanding of the inter-dependencies and responsibilities that stem from being in care relationships within society, inclusive of both human and non-human relationships. Bond and Barth (2020) discuss care in the context of climate change adaptation, and also consider care more generally at the intersection of ethics, social justice and responsibility. Climate change is known to have disproportionate impacts on women and caregivers in less-developed countries, where it can have a compounding impact on financial and political uncertainties (Fresnillo Sallan, 2020).

These studies take a broad view of care, albeit one which is inclusive and applicable to unpaid care services. To better support unpaid care work, it is necessary to understand and articulate the diverse impacts of climate change on unpaid care. This involves direct effects from natural disasters, threats to water and food supply and forced displacement, among other impacts of climate change, as well as the indirect impacts and sometimes unintended consequences of climate change adaptation and mitigation action. As an example, Westholm and Arora-Jonsson (2018) consider economic stresses that could be introduced through forest management practices (that is, forest protection to avoid greenhouse gas emissions), and how resulting economic challenges could trickle down to impact women and caregivers.

This discussion paper presents ideas to improve the awareness of environmental and climate change considerations within unpaid care. Specifically, representations of the environment within the Razavi (2007) care diamond are proposed as a way to formalise (i) the intrinsic value of a nurturing environment in supporting care and (ii) ways by which climate change and

environmental degradation can lead to pressures on provision of care, both directly and through impacts on the other support systems within the care diamond. A better articulation of the interconnections at the care–climate nexus could help to facilitate investments in care and avoid unintended consequences within climate change mitigation and adaptation efforts.

9.2 Impacts of climate change on care

The environment supports the provision of care in many ways, particularly in the context of developing countries where unpaid care workers spend a significant amount of time committed to responsibilities such as the collection of water and firewood, subsistence farming and the management of multi-generational households (for example, cooking, cleaning, basic health care, education). By extension, climate change can have direct impacts on these activities and on regional food and water security, from droughts that produce crop failures and food shortages to greater distances to gather water (see, for example, Bond and Barth, 2020; MacGregor et al., 2022; Pearse, 2017; UN Women, 2023). This is an existential threat, and it also cuts into the time and energy available for household management and care. Extreme weather and climate events such as droughts, floods and heat waves are becoming more frequent and severe as a result of climate change (IPCC, 2022a), with relatively little understanding of the implications for care.

Extreme weather events can also disrupt public services and infrastructure, impacting supply chains and access to food, water, energy and health care (see, for example, Floro and Poyatzis, 2018; MacGregor et al., 2022). This hinders state and market support for care, which impedes access to essential resources and increases the burden on households. Environmental disruptions also contribute to financial stresses across all actors in the care diamond and can increase security risks for girls and women (Caretta et al., 2022; UN Women, 2023). In addition to natural disasters, sustained environmental impacts, such as aridification and sea level rise, and political instability resulting from or aggravated by climate change can also lead to displacement and migration (IPCC, 2022a). This can have debilitating impacts on health, the availability of resources and provision of care (see, for example, Butt et al., 2020; UN Women, 2023). In many cases, climate change acts as a contributing factor or stress multiplier to pre-existing vulnerabilities. This is particularly true for less-developed countries, but the global North is also vulnerable to natural disasters such as floods, drought, wildfire and heat waves.

Despite the many linkages, the Intergovernmental Panel on Climate Change (IPCC, 2022a) gives little direct attention to unpaid care work and the vulnerabilities of unpaid care services to climate change. The phrase “unpaid care” appears just once in the 3056-page document, within a box on page 2701 that discusses Integrating Gender, Climate Justice, and Climate Change (Schipper et al., 2022). Discussion of care work in the IPCC context is focused on differential and gendered impacts of financial stresses that can arise in less-developed countries through climate change mitigation policies, such as paying a region to set aside its forests, thereby undercutting local economies (see, for example, Arora-Jonsson et al., 2016; Westholm and Arora-Jonsson, 2015). Broadening the search terms, “care work” appears twice in IPCC (2022a), both times with reference to health care workers, and there is only one appearance of the word “care” in the IPCC (2022b) Summary for Policymakers, which refers to health care impacts of extreme weather events.

It is not that the IPCC is neglecting the impacts of climate change on unpaid care; the IPCC is charged with providing an assessment of existing peer-reviewed literature, and there has been limited attention in the literature to the interactions between climate change and care work. Conversely, as identified by Lorena Aguilar et al. (UN Women, 2023), there are many relevant references in IPCC (2022a) to climate change impacts on water resources, food, water and geopolitical security, development activities, gendered impacts and migration, all of which are directly relevant to unpaid care. An example cited by UN Women (2023) relates to the availability of clean water: “Climate-induced water scarcity and supply disruptions disproportionately impact women and girls. The necessity of water collection takes away time from income-generating activities, childcare and education” (Caretta et al., 2022). Much of the relevant IPCC text on health care also maps directly to care work, for example, “Health and well-being would benefit from integrated adaptation approaches that mainstream health into food, livelihoods, social protection, infrastructure, water, and sanitation policies requiring collaboration and coordination at all scales of governance” (IPCC 2022b).

While the climate community is aware of and is monitoring some of the changes and vulnerabilities that are essential to care services and unpaid care work, the intersections are not well documented. The gap largely reflects a need for the climate and care communities to come together to shine a more direct light onto care work and its sensitivity to climate change. Suggestions presented below to explicitly include the environment and climate change within the classical Razavi (2007) care diamond are intended to facilitate that conversation.

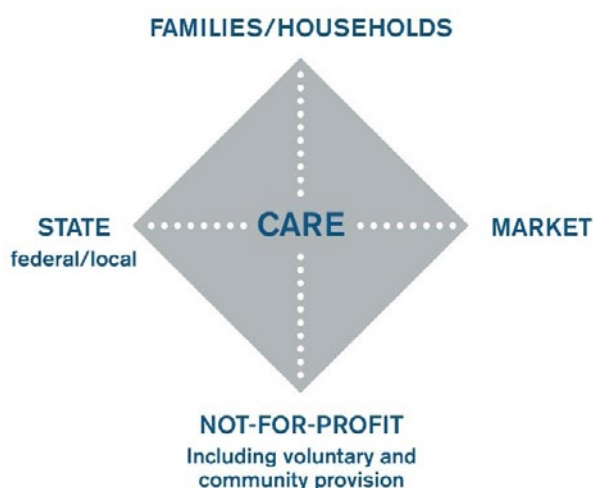
9.3

Formalising climate change considerations in provision of care

Nelson et al. (2002) and Butt et al. (2020) discuss the need to mainstream gender in climate change policy, rather than include gender considerations as an afterthought in climate change adaptation initiatives. It can also be argued, in the opposite sense, that climate change needs to be mainstreamed into gender and care policies within development initiatives. The literature concerning the climate–care nexus and operationalisation of climate change considerations within development and humanitarian work, including implications for unpaid care, remain under-developed (MacGregor et al., 2022).

The Care Diamond

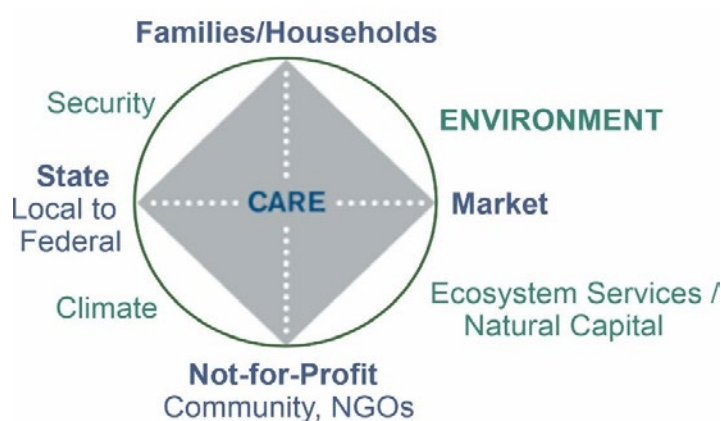
Razavi (2007) advanced the idea of a “care diamond” to visualise the various and complementary roles played by families and households, the market, the state and community and non-profit actors in the provision of care (Figure 1). Razavi (2011) notes that the care diamond was introduced as an “organising device” to help sort research literature and the structures in place for provision of unpaid care. It was not intended to be taken as an analytical or conceptual framework. Nonetheless, it provides a helpful frame to think about the role of various sectors of society in the provision of care. The care diamond is also an anthropocentric framework, which does not easily accommodate services and enabling conditions provided by the environment or related pressures on care that result from environmental and climate change.

FIGURE 1: The care diamond (Razavi, 2007)

Source: Image from the [Helvetas Gender and Social Equity](#) initiative *Bridging the Gap: A Practical Guide to Intervention*.

Reshaping the Care Diamond

The care diamond can be reframed in different ways to reflect the contributions of the environment to care. A circle enveloping the care diamond (Figure 2) is one way to illustrate that the family, community, state and market systems that provide care are embedded in and dependent on the natural environment. The encompassing environment includes the climate system, the hydrological cycle, biodiversity, ecosystems, oceans, soils and forests, among other elements of the natural world that society relies upon. Degradation of the supporting environment creates pressures on different quadrants of the care diamond. This device provides a simple framework to visualise both the necessary supporting role of a stable environment and the impacts of climate change on unpaid care.

FIGURE 2: The environment in relation to the care diamond

The household and societal systems that provide care are embedded in the natural environment. Environmental degradation and climate change can stress different quadrants of the diamond, impacting environmental security, state and market stability, and the availability of ecosystem services, such as natural resources, that support the delivery of care.

The environment that encircles the care diamond includes the climate, nature, biodiversity, oceans, water cycle and water resources, weather variability and extremes, soil, air and water quality and associated pollutants, environmental pathogens and zoonotic diseases, and spaces of deep historical, cultural and spiritual value. Much of this is often described in terms of ecosystem services or natural capital (see, for example, Guerry et al., 2015; Turner and Daily, 2008). Resources such as country foods, crops, water and firewood also fall under this umbrella. In addition, a stable environment promotes household, community, financial and state security. On the opposite extreme, climate-change-driven drought or sea level rise can destabilise a region and trigger displacement and migration. Environmental and climate change pressures can undermine households, community and public infrastructure, and market care services.

As an alternative configuration, the care “star” pictured in Figure 3 may better express the active role that the environment plays in the provision of care. A stable and healthy climate supports a more reliable supply of food, water and other ecosystem services that are essential to the quality of life and the work of care. In contrast, extreme weather and climate events or long-term climate change impacts, such as drought and sea level rise, can lead to agricultural failure, loss of livable land, political instability and undermining of the foundations that support care. This would be represented by a collapse or fracture of this arm of the care star.

FIGURE 3: The care star



The environment can also be visualised as an additional source of care, that is, as one arm of a care star, more explicitly representing the role of the environment in the provision of care, for example, through the availability of food, water and environmental stability.

Interactions and feedbacks between the five arms of care provision in Figure 3 also need to be recognised, as climate change can directly impact the provision of care or it can compromise the other arms of the care star, for example, floods or extreme weather events that limit public care services. Such interactions are also true within the care diamond. For instance, the availability of community or state support for childcare can relieve pressure on families and households. Hence, the care diamond, care circle and care star all need to be recognised as simple representations of a complex system that involves dynamic interactions and feedbacks. The increasing impacts of climate change on this system and intersections with climate change policy and action create a need to better understand these dynamics. A nuanced understanding is necessary, as there is not just one “system”. The impacts of climate change are regionally variable, and this is even more true for the geographic, cultural and economic influences on care structures in different parts of the world.

9.4 Summary

This reflection seeks to bring attention to the role of the environment in the provision of care services. By representing the ways in which nature and environmental resources serve as a source of nurture, one can more directly consider how environmental degradation and climate change have the potential to threaten households and the support systems for care. More awareness of the care–climate nexus within climate policy efforts can also help to avoid unintended consequences within climate change mitigation action, increase the focus on care activities within climate change adaptation initiatives and bring attention to care within evaluations of loss and damage (MacGregor et al., 2022).

Interest and awareness are growing with respect to the impacts of climate change on care work. Two good examples of this are (i) the framework being developed by the Southern Centre for Inequality Studies at the University of Witwatersrand in South Africa to integrate gender equality and care into climate change discussions and actions, and (ii) Fundación Avina’s **Climate and Care Initiative: Intersections for Systemic Change**, created to advance recognition of “the intersections between climate and care by generating evidence and actions that inform researchers, funders, and policymakers to address these crises simultaneously for a just transition.” A recent discussion paper from the **United Nations Entity for Gender Equality and the Empowerment of Women on the “climate-care nexus”** is another indication of this emerging focus (UN Women, 2023). This paper delves into this nexus with a focus on gender and equity and is a natural extension from long-running conversations concerning climate justice (see, for example, Khan et al., 2020; Morgan and Petrou, 2023).

Resources are being directed towards this through programmes such as **Addressing the intertwined care and climate crisis: Research for action**, funded by the International Development Research Centre (IDRC) of Canada. Within its UNFCCC Paris Agreement commitments, the Government of Canada has pledged that **at least 80% of its international climate finance contributions (C\$5.3B from 2021–2026)** will integrate gender equality into the project design. This is a tremendous opportunity for investments within this envelope to value and support care systems and unpaid care work as part of climate change adaptation and mitigation activities, and as a part of broader UNFCCC climate finance mechanisms, for example, programmes under the **Green Climate Fund**.

Going forward, it will be beneficial for the care community to more thoroughly document the connections between climate change and care in the peer-reviewed literature, including case studies of both direct and indirect impacts. This is urgent in less-developed countries (see, for example, Floro and Poyatzis, 2018; MacGregor et al., 2022; UN Women, 2023) and is also relevant in the global North, where structures and supports for care are increasingly disrupted by extreme weather events and foresight is necessary to plan for the impacts of increasing global migration and instability that is driven or aggravated by environmental disruptions. The care–climate nexus is beginning to be better documented, particularly within the discourse on gender and equity and the mainstreaming of these lenses in development and climate finance, but much of this is found in the “grey literature” that climate scientists and climate policy analysts may miss. The health sciences community provides a good model, with their high-profile knowledge assessments in *The Lancet* (Romanello et al., 2023), which greatly advances understanding of climate change impacts on health, wellness and health care delivery.

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SECTION 10

Linking care and climate: Towards gender justice in “just transitions”

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10.1 Introduction

The language of ‘just transition’ has been widely adopted by those engaged in environmental and climate justice movements, as well as by the key supranational bodies, international organisations, governments and corporations engaged in climate debates and policy making.² The umbrella use of the term encompasses a wide range of ideas about both the nature and end point of transition, and what constitutes justice and for whom. Various approaches may thus emphasise different goals, processes, groups or outcomes; by extension they make invisible some groups or the processes that disadvantage them, while failing to take into account injustices likely experienced by more marginalised or vulnerable populations. In this think-piece, our concern is with gender justice, particularly as this plays out among women from lower-income groups in less-developed countries or regions, as well as minority or racialised groups or those facing particular disadvantage due to their location or the ways in which their livelihoods are affected by climate change.

As other writers in this series also point out (see, for example, Elson and Vela-Almeida), the labour of care and social reproduction are at the core of any understanding of gender inequality. The highly feminised work of care that underpins structural inequalities along gender lines is found in all economies, and places women at a particular disadvantage in contexts of climate change disruptions to livelihoods. Furthermore, “women’s work” in the reproduction of humans – and often by extension of nature and the environment on which they depend – is key to processes of adaptation, response to climate impacts and longer-term mitigation and environmental management. Floro (2024) provides compelling evidence and arguments for “getting care onto the gender-just transition agenda”. Indeed, any transition that does not explicitly address gender inequalities is unlikely to be “just”. But what is also at stake is that climate transition policies that fail to address this intersection of climate and gender justice – to which care is fundamental – will be less likely to succeed or not be sustainable (Cerise et al., 2024).

This brief starts from the premise that any notion of a “just transition” to a low-carbon and sustainable economy cannot be “just” unless it considers the underlying structural inequalities

associated, in particular, with the way care or, more broadly, social reproduction are or are not accounted for. Drawing on extensive feminist scholarship, it recognises, furthermore, that the same structures and power dynamics that have contributed to the current ecological crisis – including unsustainable patterns of production and consumption, extractivism and unsustainable wealth accumulation – have marginalised women in access to resources, formal employment or economic or political power. It then seeks to articulate a more expansive view of justice needed to transform the structures and hierarchies of power that enable and reinforce both social and gendered inequalities and ecological degradation.

It does this first by critically analysing the meanings attached to “just transition” embedded within diverse approaches to climate change and low-carbon transitions, foregrounding the “world views” behind these approaches. It draws out the views of “justice” embedded in different approaches to “just transition”, and the extent to which gender is considered in these, before asking what would constitute a “gender-just” approach. Drawing on an extensive review of feminist scholarship, with a particular focus on ideas related to care and social reproduction, we consider what a more expansive notion of justice should include for climate and transition policies to be “gender just”.

10.2 Climate transitions and versions of justice

The concept of “just transition” is broadly used to describe the principles, processes and practices intended to ensure that transitions to a low-carbon economy are socially just. It emerged initially in the USA in the 1970s as trade union and worker organisations, concerned with the impacts of new environmental legislation on workers in polluting industries as well as the occupational health and safety of workers in such industries, sought to facilitate a transition to new forms of employment for their workers (Climate Justice Alliance, n.d.; Just Transition Research Collaborative, 2018a). The term gained wide currency as diverse groups, including worker, environmental, Indigenous rights and gender advocates, all recognised ways in which “just transition” could express their own priorities and concerns for environmental, energy and social justice (Newell and Mulvaney, 2013). Empirical analyses from global North and South have highlighted the problematic ways in which, for example, energy transitions have often disproportionately impacted marginalised communities, including communities of colour or indigenous or First Nations peoples, whether through environmental degradation and pollution, or dispossession and disruption of traditional use and custodianship of land and resources (Newell, 2021). Representatives of such groups are often central to environmental justice movements.

The climate crisis creates the urgent imperative to transition away from fossil fuel dependence and towards sustainable production and consumption. In this context, the concept of just transition has gained common currency, travelling far from its early comparatively narrow concern with the loss of formal jobs to its adoption by a diverse range of stakeholders, integrating a wider set of concerns, but with differing interests, approaches to transition and interpretations of justice. For some, there appears to be an implicit assumption that any transition that responds effectively to the urgency of the crisis facing the planet and its people must by implication be “just”; for others, the focus is on addressing climate or environmental harms or transition costs for those most directly affected (such as workers in directly affected industries); while others encompass

concerns with underlying structural inequalities, exclusion and the need for redress of historic harms and injustices.

A range of approaches to the conceptualisation and implementation of low-carbon, “green economy” or related transition policies, and by extension views of “justice”, can be found in the literature (see, for example, Just Transition Research Collaborative [JTRC], 2018b). These reflect the contested nature both of what a green or sustainable economy is (the outcome) and how the transition can be achieved (the process). Clapp and Dauvergne (2011) outline four perspectives or “world views” which they termed market-liberal, institutionalist, social green and bioenvironmental. These informed Cook, Smith and Utting (2012) who applied this in analysing the social dimensions of green economy as inputs into Rio+20 discussions. These world views remain relevant and inform the more recent JTRC typology of policy approaches reflecting, respectively, the status quo, managerial reform, structural reform and transformation (Table 1, column 1). Table 1 provides a simplified overview of such approaches to green economy, low-carbon or climate transitions, and suggests what these might imply for transition policies and actions and for “just” process or outcomes. They describe alternative pathways to a green economy, rooted in normative positions concerning, in particular, the role of the market, including the use of carbon credits or other market mechanisms for inducing transition, versus the role of the state, whether in industrial policies or in social welfare and forms of redistribution, and whether change can take place within the current economic system or to what extent this needs transformation.

Such “ideal-type” categories inevitably overlap, with similar elements appearing under multiple pathways. Nonetheless they usefully “highlight different sets of ideas, actors, policies and institutions, each with its own potentials and limitations” (Cook, Smith and Utting, 2012: 3). Each approach reflects the interests of different groups of stakeholder or advocate, with points of contention concerning “the relative and legitimate roles of markets, state and community in achieving sustainability” as well as “whether problems are viewed as technical or political, whether solutions can be incremental or require deeper structural transformation; the extent and nature of participation; and whether pre-existing inequalities need to be addressed first in order to achieve a just transition” (Cook, Smith and Utting, 2012: 3). As García-García, Carpintero and Buendía (2020) note, governments and the private sector tend to reflect status quo or top-down managerial reform approaches in their policies and actions; some may also support technological or geo-engineering solutions. These may in part be justified by the need to take fast decisions and action. In contrast, representative organisations and environmental activist groups, including unions, racial justice organisations, First Nations groups and gender justice groups, are more likely to support transformative or structural reform approaches rooted in (generally slower) social and political deliberative processes.

International organisations also play a critical role in shaping discourse and norms as well as the implementation and financing of global / transnational issues, engaging with the concept of “just transition” in ways that reflect their specific mandates and basis in human rights. Thus, the International Labour Organization (ILO) refers to: “A just transition for all towards an environmentally sustainable economy ... [that] needs to be well managed and contribute to the goals of decent work for all, social inclusion and the eradication of poverty” (ILO, 2015: 4). The 2015 Paris Agreement similarly calls for “the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities” (United Nations, 2015: 4).

What views of justice lie behind these varied world views and approaches? Plentiful evidence exists of climate “injustices” through the impacts of climate change and of transition policies. These injustices are rarely explicit in world views concerned with the status quo, market solutions or addressing climate without system change. In such approaches, the risks are therefore real that transition, mitigation or adaptation policies will replicate, reinforce or reproduce structural – including gender – inequalities. Some of the key fault lines among approaches revolve around the extent of belief in market mechanisms, such as carbon markets / credits and payment for eco-system services, and technological solutions; these often rely on top-down decisions driven by experts but may neglect to consider how costs and benefits are distributed or impacts and outcomes experienced more widely. An “efficient” solution to deal with the urgency of the situation may be traded off against arguments about equity or justice. Institutional and structural reform approaches are likely to place greater emphasis on distributional outcomes, identifying losers from transition processes and those structurally excluded, as well as focusing more on process, expanding views of justice to procedural and recognitive aspects.

Thus Sovacool et al. (2019) argue that “major socio-technical transitions require open and democratic participation by a wide range of actors, including firms and consumers, as well as civil society groups, media advocates, community groups, city authorities, political parties, advisory bodies and government ministries to minimise unwanted impacts” (Sovacool et al., 2019: 582). Others arguing for transformative approaches, including many feminist scholars and activists, highlight the ways in which values, power relations and systems underlying the capitalist organisation of society and economy enshrine inequality along gendered and racial, among other lines and, in a similar way, systematise exploitative and unsustainable relationships with the environment (Gaard, 2015). They argue that market-based “solutions” that focus on efficacy and efficiency and fail to challenge these fundamental tenets of capitalism “have little to say on issues of social justice” (Bailey, Gouldson and Newell, 2011: 700).

Recent years have seen greater interplay among different actors, with changing behaviours and a growing attention to “just transition”. Many corporations are engaged in or even leading shifts towards sustainability, putting into practice some interpretation of “just transition”, and in many cases articulating broader concerns with justice. These may include, for example, attention to impacts on local communities and the need to collaborate in developing the wider eco-system necessary for alternative energy sources, or on a more just distribution of energy resources. Environmental activists and representatives of the youth generation increasingly sit on corporate boards or are invited into spaces of deliberation – from COP and UN meetings to national and local processes. From a gender and global South perspective, such a focus would also need to include justice for those who rely on unpaid labour (usually women and children) to access fuel sources (possibly to the detriment of their local environment) or whose environment and livelihoods have been severely degraded by fossil fuel extraction.

10.3 Gender: The neglected dimension of justice

The values and approach to justice that underpin the approaches or world views briefly outline above show a range of attitudes to or concern with justice, but structural inequalities, including along lines of gender, are often rendered invisible or viewed as an impediment to addressing the “urgent” climate crisis. Even among these actors who tend towards more transformative

approaches, many may lack a *gendered* understanding of the fundamental ways in which care and reproductive work underpin the productive economy and, by extension, the drivers of ecological and climate crisis. Thus, we need to turn to feminist scholarship and epistemology to expose gendered values and biases in knowledge production and policy approaches.

In the context of climate and environmental change, feminist social theory and epistemology broadly challenges dominant framings of climate change and its solutions as a scientific and technological problem where relevant knowledge is “objective, value-free, and independent of social location” (Moosa and Tuana, 2014: 678), while also drawing on a range of disciplines and methodologies to demonstrate how “moral, political, economic and scientific frameworks for understanding and responding to climate change might be positively transformed” (Moosa and Tuana, 2014: 676). Feminist scholars also note commonalities between feminist and ecological interests, where women’s (unpaid) work, like natural resources, are treated as an infinite resource and considered subject to male authority, with the consequent undervaluation of care work and nature (Ilkharacan, 2016; Nelson, 1997).

Arguments about the possible trade-off between urgency and justice are, of course, part of a long-standing debate in economic development, where the priority given to efficiency over equity has been heavily implicated in the ecological crisis as the push was to first expand the economy, leaving environmental or distributive social consequences to be addressed later. As feminist scholars have long argued, this line of thinking that contributed to the climate crisis also has its parallels in driving what some see as the “crisis of social reproduction” (Fraser, 2022). Arguments linking, specifically, care and climate crises forcefully came to the fore during Covid-19, which brought home the importance of care work and related services – so-called “essential work” (ILO, 2023; Stevano, 2024) as a basis for economic and societal well-being. Many policy responses to the pandemic-driven economic crisis linked recovery with climate crisis, leading to the emphasis on “green economic recovery” and “building back better”. The role and value of “essential work” was, however, quickly forgotten, and recovery measures – particularly in low-income contexts – often sat alongside austerity measures that undermined funding and provision of social protection, care and social reproduction.

Different sources of knowledge and ways of understanding social and environmental relations are thus needed to inform analysis of both the causes of the climate crisis and opening possible pathways towards gender transformative solutions. An expansive and gendered view of justice is required to transform the structures and hierarchies of power that enable and reinforce both social inequalities and ecological degradation.

10.4 Towards a “gender-just” transition

A more expansive view of justice that can better incorporate the structural gender inequalities that underpin climate injustices must as a matter of priority address the issue of care. As argued above (and in other think pieces), care is central to the ways in which climate change differentially impacts different groups and how populations, households and individuals – through the work predominantly of women – absorb the shocks of crises (Elson, 2012); it underpins the productive economy, and it will be key to any sustainable adaptation and mitigation efforts. The following discussion draws on key concepts from feminist literatures related to social reproduction and

care, which have their parallels in ecological and environmental literatures and which highlight their interconnections.

One such concept is “depletion”. Used in environmental accounting to assess the depletion and degradation of natural resources, this term has been applied by feminists to put a spotlight on the consequences of unpaid care and domestic work for individuals, households and communities. Drawing a parallel with environmental degradation, depletion occurs when the outflows of unpaid care and domestic work combined with the inflows of medical care, income earned and leisure time, fall below a threshold of human – biological, financial and emotional – sustainability (Rai, Hoskyns and Thomas, 2014). Such analysis brings to the fore the way in which economies rely on the depletion of women’s time and health as well as natural resources to function.

Reversing the harm of depletion requires mitigation, replenishment and ultimately “regeneration” – another concept relevant for both the environment and gender equality. In the context of environmental justice, regeneration refers to not only limiting harm to the environment, but actively restoring and renewing ecosystems and natural resources (Lovins et al., 2018). From a feminist standpoint, the concept of regeneration has been interpreted to include prioritisation of, for example, (re)building of social infrastructure to prevent the depletion of women’s time and resources, thus recognising the value of both the paid and unpaid economy; participatory and inclusive processes that enable women to put gender-specific issues on political agendas; and the establishment of accountability mechanisms for rebuilding that are focused on a bottom-up approach to regeneration with participation from women’s organisations and civil society (Rai, True and Tanyag, 2019). Ecofeminists have also conceptualised unpaid care and domestic work as “regenerative labour” (Salleh, 2017).

Concepts such as “depletion” and “regeneration” are clearly central to any notion of sustainability (environmental, economic and social). These concepts highlight the shared concerns and analytic frames around the maintenance and reproduction of both natural and human resources. These concepts also lead to a focus on time as a key resource, and by extension of “time poverty” – generally shown in time-use surveys to affect women disproportionately over men. In addressing these concerns, scholars return to the idea of “the commons”. Given the position of social reproduction as beyond the boundary of productive activity that is rewarded in the market, there must then be a greater emphasis placed on “the commons”, that is, those things that contribute to the common good, including nature, but also community, public services and social provisioning, that enable all women and households to meet basic well-being and reproduction needs without depleting either themselves or the environment or resources on which their household and community livelihoods depend.

From the ecological literature and concerns with sustainability within planetary boundaries comes the additional notion of “sufficiency”. In ecological terms, sufficiency concerns “living better with less” (Hickel, 2019) or “the minimum that enables people to flourish” (Daly, 2013 cited in Mellor, 2019). This implies reducing consumption among the affluent while allowing others to increase material consumption to meet sufficiency needs – including the demands of social reproduction. The concept helps to move the idea of transition away from one focused on efficiency and on-going production and growth, to one concerned with overall limits or planetary boundaries and societal needs. For feminist economists, a “sufficiency economy” must thus go beyond standard economic concerns with production and consumption to incorporate

social reproduction. Sufficiency then implies adequacy of resources – whether obtained via the market or other mechanisms – for the reproduction and well-being of individuals, households and communities, and makes explicit and places priority on the role of non-market activities such as unpaid care in the reproduction of labour for market production. Drawing on the work of ecologists concerned with meeting needs or provisioning within natural resource constraints, according to Mellor (2019: 192) “*Sufficiency provisioning* thus implies a dual objective: the provision of goods and services necessary for social reproduction ... governed by the twin principles of environmental sustainability and social justice”.

Justice concerns are central to these concepts, and some possible implications for a “gender-just” transition are summarised in Table 2. Distributional justice relates to how work, burdens or responsibilities are shared, with non-monetary dimensions including issues of choice or preference as well as well-being deficits, time poverty and depletion. There is also an inherent justice concern with what is valued: in mainstream economics, value is attributed by the market, while the (unmarketised) “care economy” is viewed as “governed by norms rather than market signals, difficult to assign a value to” (Cook and Kabeer, 2023: 2). Thus the “value” attributed to care lies outside the market relations of the productive economy and may be associated instead with a “moral” economy – work that women undertake or take responsibility for as part of a “moral order”, based on patriarchal structures and social norms. Feminist ethics or philosophy critically examines the ways in which care work (of people and of nature) is often linked to such moral arguments around the “right” role of women and the value attributed to this role, and argues instead for the need to separate an approach to care from such moral arguments (Mellor, 2019). Reclaiming “provisioning” as about “sufficiency” rather than growth, centring care as central to provisioning, and seeing “sufficiency provisioning” as a social responsibility or concern requires a transformative approach to a just transition: one that values care (of people and of nature) centrally in the way economy, society, provisioning and its distribution are organised. As Tronto (2020) argues, an “ethic of care” approach would recognise care work not as a matter of moral responsibility, based on moral argument or closeness to nature, but as a central feature of debates (including those about climate change and the productive economy) from which it is currently largely absent.

In conclusion, the current challenge is how to make these arguments so that policy makers and others take seriously the ways in which both unpaid care work and social reproduction, and the well-being of the planet, can support and sustain systems of production and consumption in a sustainable way. Core to this is the question of how to undertake a low-carbon transition that does not rest unjustly on women’s unpaid or undervalued labour. Such arguments have been developed by UNWomen in their “feminist plan” and examination of the care-climate nexus (Aguilar, 2023; UNWomen, 2021). In Ilkharacan’s words (2016: 6), the “Green economy needs a re-organization and regulation of production and consumption in harmony with the pace of renewal of natural resources; the purple [care] economy needs a re-organization and regulation of production and consumption in harmony also with an equitable and sustainable system of reproduction of human beings”. An approach to climate transition that responds to climate crisis with solutions based on further growth – even “green” growth – within an economic system that does not fundamentally recognise care and social reproduction as underpinnings of an unfair system of production and distribution, cannot be a “just” transition.

Actions in this direction involve at a minimum the principle that transition policies do not harm the most vulnerable, nor do they exacerbate structural inequalities, and that interventions ensure

protection and livelihood security for such groups. Public investments should be guaranteed for extending social provisioning and protecting the commons, alongside ensuring energy access and corporate support for energy transitions. Growth debates must shift from the paradigmatic focus on gross domestic product (GDP) to considering a broader economy of well-being that guarantees sufficiency livelihoods and basic rights for all. The relationship between ecological harm on the one hand and failure to protect the social foundations of the economy on the other are inextricably linked. Climate solutions can ultimately succeed only if embedded in a social context. None of this can be realised without the work of caring for people as well as nature: such work needs to be recognised, valued and rewarded, not just as a key input into a productive economy, but also as the foundation of just, equitable and sustainable societies.

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TABLE 1:

Just transition approaches	Policies and actions	Approach to “justice”?
<i>Status quo (business as usual)</i> “Market liberal” approach to green growth “Greening” of capitalist economy through private, corporate and market-driven changes Heavily dependent on corporate actors through market mechanisms Optimistic about break-through technologies and markets to maintain growth while reducing carbon and material inputs	Carbon pricing / markets Break-through technological solutions Government incentives for innovation and for businesses to reduce carbon and material inputs Market incentives lead consumers to reduce consumption Corporate job retraining programmes, compensation for affected workers	Limited direct focus on justice and equity beyond directly affected employees Primary focus on new job creation / employment transitions and worker retraining as a vehicle for justice
<i>Managerial reform</i> Institutionalist approach to ecological modernisation Adaptation of current growth model; leaving broader capitalist system and power relations unchallenged Recognises the role of key public / state and social institutions including, for example, Trade Unions as well as key international organisations (such as UNEP, ILO) Expanded role for the state / public sector and private/public partnerships etc. to reduce emissions, increase efficiency of resource use and retain / create employment	Improve eco-efficiency through technologies Market incentives to reduce material / energy inputs and pollution Private sector enabled to pursue low-carbon solutions Investments in low carbon technologies create new jobs and growth alongside carbon reduction State supports labour and employment / workplace transitions through social dialogue	Greater focus on “distributive justice” primarily for affected workers Address inequalities directly related to transitions e.g. communities that are fossil fuel dependent Optimistic about win-win opportunity of growth / job creation alongside carbon / material input reduction and thus potential for sharing gains through jobs and redistribution
<i>Structural reform</i> “Social green”, energy and climate justice movements Recognises limits to “green growth” – eco-efficiency gains will be overwhelmed by increasing demand; reduce consumption towards “sufficiency” Requires institutional change and challenges dominant political and economic power structures; aims for more equal redistribution of power and resources and wider participation in decision-making	New forms of governance, institutions and structures that govern energy production and global supply chains (including circular economy) Greater focus on collective solutions, “commons”, public goods and ownership of key assets Recognises need to change / reduce consumption particularly among affluent groups	Greater attention to “distributive justice” including ownership, access or control of resources “Procedural justice” established through inclusive and equitable decision-making processes Aims for a more equitable distribution of benefits or access (e.g. to energy) via collective management of energy and other resources

Transformation Supports a radical change of the economic system and structures which are held responsible for environmental / climate and broader socio-economic injustices Requires fundamental change in economic and political structures that underpin and reproduce environmental and social injustices Requires delinking material inputs from growth and questions whether a transition can be accomplished within a growth paradigm Climate finance needs to include compensation or reparations for past injustices	Moves beyond the worker-centric “just transition” to look at broader interrelated / structural inequalities Focuses on changing political and corporate structures seen to benefit elites Solutions involve grassroots empowerment, everyday resistance and struggle, and the power of movements Overall reduction in material inputs required through decrease in consumption among affluent economies Global redistribution, including compensation or reparations for climate injustices	“Recognitional and procedural” justice: inclusion of groups traditionally marginalised or excluded or subject to exploitation or dispossession Broader views of justice that envisage progressive economic and social systems: justice includes efforts to dismantle systems of social oppression (patriarchy, racism, class) “Reparative justice”: through global redistributive mechanisms, climate reparations and compensation
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Source: Adapted from Cerise et al. (2024)

TABLE 2:

Dimensions of justice	Traditional view for a just transition	Expansive feminist view
Distributive	Mitigating against job losses in fossil fuel sectors Equitable access to “green” jobs Managing energy costs Avoiding and compensating harm	Public provision of social goods within ecological limits (sufficiency provisioning) Valuing and redistributing unpaid and paid care work Access to decent work (including for informal workers, care-workers) Access to the “commons” – resources / land rights etc.
Procedural / participatory	Due process Participation of stakeholders	Collective action and cross-movement building between environmental and feminist organisations Accountability, inclusion and participation in decision-making, including over publicly owned resources and commons and over transition policies and programmes
Recognitive	Respect for differences between groups Recognition of key stakeholders	Recognition of unpaid care work and care for the environment Measure and value metrics other than GDP that support well-being Valuing and recognising alternative knowledge and customary practices including of indigenous groups, women, etc. Ensuring recognition of rights or entitlements (to common property, land and other resources) as basis for participation
Restorative / reparative	Redressing harm, “polluter pays”	Reparations for loss and damage especially for marginalised groups Acknowledge, compensate and repair gendered harms by industry to both people and environment – e.g. pollution and its impacts on health Ecosystem restoration (such as mine rehabilitation); protection and restoration of commons Restitution of lands and sovereignty, protection of rights

Source: Cerise et al. (2024)

SECTION 11

Climate change, care and migration

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11.1 Introduction

Today, extreme weather and climate-induced disasters across the globe – heatwaves, extreme cold, wildfires, droughts and water stresses, floods, sea level rise and hurricanes – are making it abundantly clear that the speed and intensity of climate changes are unfolding before our eyes, as are their devastating impacts on people, communities and ecosystems (Canada, 2024; ECCC, 2024; Economic Times, 2024; EU-World Drought Atlas, 2024; Guardian, 2024; Lancet, 2023; Nasa, 2024; World Meteorological Organization, 2024). While physical infrastructural damages, economic disruptions and losses, and human casualties and deaths resulting from such climate events are immediately visible, we must not forget other less visible but equally devastating and pervasive outcomes, such as heightened care needs, increased mental health stresses, disintegration of social and community networks, and forced displacements and migration.

There is now growing public awareness about climate-induced migration and displacement. Indeed, recent years have seen a small but emerging area of research that shows direct and indirect linkages between climate change and voluntary and involuntary migration and displacement (Almulhim et al., 2024; Barrios, Bertinelli & Strobl, 2006; IDMC, 2024; Podesta, 2019; Parrish et.al., 2020; Semenza and Ebi, 2019). To be sure, a growing number of policymakers and global policy institutions and organisations are now calling attention to climate-induced migration and displacement as the next big global agenda. The UNHCR (2016), for example, notes that between 2008 and 2016, an average of 21.5 million people were forcibly displaced annually by weather-related events. According to the World Bank (2021), the six climate vulnerable regions of the world – sub-Saharan Africa, South Asia, Latin America, East Asia and the Pacific, North Africa, and Eastern Europe and Central Asia – can expect to see over 216 million climate-induced migrants by 2050. As climate change and climate-induced disasters often coincide with sociopolitical and resource conflicts, the Institute for Economics and Peace (IEP) calculated that up to 1.2 billion people could be displaced globally by 2050 due to climate change, conflict and civil unrest (IEP, 2020).¹

¹ It also should be noted here that because climate change and climate-induced disasters often coincide with sociopolitical and resource conflicts, it is often difficult to delineate clear and direct causal links between climate change and migration / displacements.

While the majority of climate-related displacement and migration is happening in the global South, the global North has not been not spared. In the United States, for example, 3.2 million US adults were displaced or evacuated due to natural disasters in 2022, of whom more than 500 000 had not returned by the beginning of 2023 (Huang, 2023). More recently, the Hurricanes Helene and Milton that landed in Florida in late September and early October 2024, respectively, led to over 300 deaths, thousands of people being evacuated and displaced and over US\$300 billion in property and infrastructural damages. Similarly, the recent floods in Spain in November 2024 killed at least 205 people with over 1 300 more unaccounted for and thousands having been evacuated (CNN, 2024). Climate-related displacement and migration intensify the demand for social, physical and mental healthcare, at a time when the conditions for such care are most unstable and insecure. It is therefore imperative that we pay greater attention to climate-induced migration and displacement and to understanding migration and displacement as an integral part of the care and climate nexus as we develop effective policies, programmes and actions to ensure a sustainable and resilient future for all.

11.2 Care-climate change-migration nexus

Climate-induced migration / displacement is deeply intertwined with care and care work. There are plenty of examples that show why we need effective policies, programmes and actions to address care and migration in the context of climate change. Here, I give two cases, Mongolia and Canada: two countries with very different geographies, economies and climate contexts, and yet who share common similar climate change threats that are impacting care and migration / displacement.

Mongolia

Little known to the outside world, Mongolia is a huge country with a tiny population (less than 3.5 million!)² tightly landlocked between Russia and China. The country has been experiencing increasingly severe and intense climate challenges since the early 2000s. The steady desertification, particularly in the Gobi Desert region in the southern part of the country, and more frequent and intense extreme winters, commonly referred to as dzud,³ are destroying plants and decimating the grassland of the Mongolian steppe, killing animals (and people) and making the region less and less inhabitable for plants, animals and human (Kwong, 2019; UNICEF-Mongolia, 2024). Like many global South countries, Mongolia's economy has been heavily dependent on agriculture, livestock and natural resources, and its traditional national identity is based on nomadic herding culture. This means Mongolia, Mongolian people and their livelihood are extremely sensitive to climate change. With the desertification creating increased water stress in the summer and more frequent dzuds resulting in a large number of animal deaths in the winter, it is increasingly difficult for families to sustain their livelihood.

- 2 Mongolia with the land size of 1.56 million square kilometers and 3.47 million population, is the lowest population density country in the world.
- 3 Dzud refers to extreme cold in winter (temperature about -40 to -50°C) with heavy snow and ice. The 2023-2024 winter, referred to as the White and Iron Dzud (deep snow, freezing weather, impenetrable ice covering grasses for animals to eat), saw highest snowfall in 49 years. This resulted in over 7 million animals deaths from cold and starvation, and 20 human deaths due to severe blizzard.

The loss of agricultural and livestock capability has not only made the country's traditional nomadic herding livelihood unsustainable, plunging herder families into poverty, but has also forced them to uproot and migrate. Over the last two decades, over 600 000 people (nearly 20% of the population) have migrated from rural Mongolia to the capital city, Ulaanbaatar. Because of the combination of high living cost and difficulties associated with the Ulaanbaatar's registration system, most of these newcomers live in the Ger districts in the outer periphery of the city. Many live in poverty, without access to running water, sewage, electricity or adequate road and other public services and infrastructures. Moreover, because of the lack of access to basic social and physical infrastructures, they are almost entirely dependent on coal for heating and cooking. This has made Ulaanbaatar one of the most polluted cities in the world (Gordillo Fuertes, 2022; UNICEF, 2023). Today, nearly 70% of Mongolians live in Ulaanbaatar, making Mongolia one of the most rapidly urbanising areas, and one of the highest urban population density countries in the world, while the countryside outside of the capital city is left looking increasingly empty, desolate and lifeless.

The rural-to-urban migration in Mongolia is almost entirely caused by climate change (Lindskog, 2014; Rauleson, 2022; Roeckert & Kraehnert, 2022). Whereas over 40% of Mongolians were nomadic herders a few decades ago, today they make up less than 30%. Sadly, while the costs of this climate-induced migration are huge and manifold, the benefits are little to none. Herder households' migrations often mean family separation and constant reconfiguration of household economic and care arrangements: mothers and school-age children and / or older and disabled people would often migrate to the city, leaving fathers and able-bodied men behind to look after animals. Alternatively, younger men and women leave for cities to seek paid employment to help support the family, leaving women, children and older people behind to care for one another and to look after animals. Or yet another alternative, families would pool resources to send their children and young people to the city for education to ensure their future paths are anything but herding animals.

We conducted over 90 interviews with herder families in 2023 and 2024. Our interviews show different ways in which herder families are rearranging their livelihoods through migration in response to climate change. For example, one of the mothers of the families we interviewed had lost nearly 300 animals, the bulk of their livestock, in the winters of 2023 and 2024 due to dzud. In response to these huge losses, the family decided to send their 21-year-old son to the city to study. When we returned to interview the family again in the fall of 2024, the mother said:

My son is now studying at the railway institute. He stuck it out with the livestock for two years until the disasters occurred. That's why he's in school now. Herding alone isn't enough to support our household, so a side income is essential. He wants to pursue both...

When asked what the likelihood was of her son pursuing both, she said:

He has to finish his school at first. He has to get a job during the summer to pay his tuition because livestock doesn't amount to much anymore. One animal won't even reach 100 [100,000MNT=US\$30] these days. So, selling off all of our livestock and being left with nothing to eat ourselves is impossible. We are trying to make sure he finishes school at the moment. If worse comes to shove, we'll sell 5 or 10 animals and pay for his tuition. He must get a profession somehow. He will be head of the house someday so he must have a profession.

The number of herder households has been declining since the 1990s. According to the National Statistics of Mongolia (n.d.), the number of herder households dropped by 25% between 1991 and 2010 as the country transitioned from command economy to a free market economic model. Although high unemployment in the city has forced some herder households to give up looking for employment in the city and return to the steppe since 2010, the number of herder households today is nothing near the earlier figure (National Statistics of Mongolia, n.d.). The rural-to-urban migration also means a breakdown of traditional community-based care support and social network that are crucial for the survival of nomadic people and herder families in Mongolia. Many fear that, as the number of herder families decline and these traditional community and social networks disintegrate, the country's nomadic herding tradition will also disappear, perhaps within one or two generations. Along with it may occur the dissolution of a core Mongolian culture and identity.

More immediate, though, such migration and family dislocation translates into, on the one hand, increased care needs, particularly for children, older people and people with disabilities who are downloaded onto fewer designated carers (almost always women) and, on the other hand, unequal access to care and support due to geography, family and financial circumstances, and the lack of public services. A 2018 UNICEF report, for example, found a 2.7-fold increase in respiratory infections in Ulaanbaatar over the previous 10 years, with pneumonia being the second-leading cause of mortality among under-five-year-old children in the country (UNICEF-Mongolia, 2018). This is directly caused by the exceedingly high level of air pollution. Migrant families living in the Ger districts are particularly vulnerable because of over-crowding and extensive coal usage; the situation is made worse by the lack of water, electricity and limited access to social and healthcare services (UNICEF-Mongolia, 2024b).

But even for normally healthy herders in the rural areas, desertification and land degradation, particularly in Gobi Desert region, have forced many to travel greater distances with their animals, pushing them farther away from available healthcare services and exposing them to increased extreme weather and tick and other insect-borne diseases (Red Cross, 2021). This has led to increased demand for unpaid care that, in most cases, is provided by women in the family, and at a time in which family and community displacement and migrations have made such care less and less available.

Canada

Such forced long-term rural-to-urban migration is not very common in Canada when compared to Mongolia. However, Canada has also seen, in more recent years, significant climate change events and disasters that have disrupted plants, animals and human ecosystems, forcing families and communities to evacuate and migrate. The record-breaking numbers of wildfires in 2023, for example, consumed almost 185 000 square kilometers of woodland – nearly one-and-a-half times the size of the Maritime Provinces and more than the total area burned in the US over the last five years. These led to 297 evacuation orders, 235 458 people being evacuated from their homes and over \$1.1 billion in property loss, not counting Québec, the epicentre of the wildfires (Canada, n.d.-a). The wildfires also left southern Ontario and Québec covered in smoke for most of June and part of July. The smoke extended to northeastern USA and even southwestern Europe (CBC, 2023; New York Times, 2023). Not only were cities and provincial and federal governments forced to issue health warnings and cancel outdoor activities, but also the smoke created a surge of hospital emergency visits with respiratory and related illnesses and ongoing longer-term health issues. At the same time, the record-breaking hot summer of

2023 (although some parts of Canada saw this record broken in the summer of 2024) also saw a large number of heat-related deaths and morbidity, especially among older people, children and people with chronic illnesses and disabilities. For example, a Québec study found that in the summer of 2023, the province saw 470 deaths, 225 hospitalisations, 36 000 emergency visits and 7 200 ambulance transports resulting from extreme heat. This happened in a province with a population of only 8.8 million, almost the same size as New York City (Bourdreault et.al., 2024).

The government of Canada and the Canadian Climate Institute's research also highlight significant human, healthcare and economic costs associated with extreme weather and heat waves in Canada (Canada, n.d.-b; Canadian Climate Institute, 2024). As if to showcase the diverse and boundless forms of weather-related disasters, the spring-summer of 2023 also saw historical rainstorms and deluge in Nova Scotia and nearby Maritime Provinces – in some cases where wildfires struck only a little while ago – destroying homes, roads and crops, and forcing families to flee. True, climate-induced migration and displacements in Canada are different from that in Mongolia: much of the climate-induced displacement and migration in Canada is short term (although reports suggest that many people are not able to return to their homes and communities even months or years later due to extensive infrastructural damages). However, like Mongolia and other places, climate-induced displacement and migrations in Canada are also associated with increased physical, emotional and mental health and care needs, both paid and unpaid, and this has strained and stressed families and individuals. And like Mongolia and other places, the six impacts of these climate-induced migration and displacements in Canada are also unequally distributed across geographies, class, socio-economic and racial and ethnic groups, with people with lower income, visible racial, ethnic and Indigenous backgrounds more adversely affected. Studies show that climate change events and disasters are disproportionately impacting vulnerable populations, and putting increasing pressures on families and women to provide care.

Moving forward

As care, migration and climate change are closely interlinked with one another, we must develop policies and programmes that will recognise and address these interlinkages. As we move forward, governments, policymakers and other social and economic actors must consider and address care and migration dimensions of care and climate nexus, and develop effective policies, programmes and actions to ensure sustainable and resilient futures for all. The following are some suggestions.

First, we must extend the understanding and recognition of the multidimensional nature of climate change and climate-related disasters and their impacts on people, communities, countries and ecosystems beyond immediate issues, such as physical infrastructural damages, economic losses and human casualties and deaths, to less immediately visible but equally pervasive issues, such as human and ecological care, displacement, and migration. Second, in order to achieve this, we must implement the following measures:

1. Establish an interdisciplinary, cross-sectoral and cross-jurisdictional policy and implementation committee to study, coordinate and manage climate change and extreme weather events and emergencies.
2. Collect, assemble and analyse data and information on the impacts of climate change on care needs and provisions, family and household economic and care arrangements, and internal and external displacements and migrations.

3. Allocate more resources to climate change adaptation planning and social and physical infrastructural development. These include a) increasing public investments in care and climate change; b) developing and strengthening climate-resilient and adaptable care centres, community services and networks at local level; c) developing climate-resilient social and healthcare systems at municipal, provincial and national levels; and d) embedding climate-resilient social and physical infrastructures in urban planning.
4. Build and strengthen local capacities and networks to respond to climate-related care and displacement / migration needs and imperatives through multi-sectoral provincial, national and global support and cooperation.
5. Develop better and more effective ways to communicate and educate the public on climate change's multidimensional impacts on individuals, families and communities, as well as on society, economy and culture, and strategies to mitigate and adapt to climate change.
6. Introduce and expand a budget line for climate change adaptation in national, provincial and local government budgets and embed longer-term care and displacement / migration services and support in the financing and allocation of climate emergency and disaster relief measures.

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SECTION 12

The impact of climate change on women's energy capabilities

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12.1 Introduction

This contribution analyses how climate change impacts women's human capabilities linked to energy – hereafter “energy capabilities” – within the conceptual framework of Sen's capability approach (Sen, 1999). Climate change intensifies global inequalities by disproportionately impacting poorer nations and vulnerable populations due to geography, socioeconomic factors and unequal access to rights (Elisha, 2020). Since climate change shows different gendered effects, women in low- and middle-income countries face heightened risks related to health, livelihoods and security due to systemic gender inequality and patriarchal structures that compromise their resilience to extreme weather events (Sorensen et al., 2018). By limiting access to reliable energy services and making traditional energy services unaffordable (Jessel et al., 2019), climate change can exacerbate the energy poverty situation of women and their families. The capability approach provides a novel framework for examining the effects of climate change on human development processes through the perspective of structural inequalities (Grazini and Guarini, 2025). This is reflected in unequal access to critical energy resources and shapes their vulnerability to climate impacts (Wasito, 2023). Focusing on the climate change issue, this approach highlights how women, especially in developing regions, face heightened exposure to energy poverty due to pervasive gender disparities.

Universal access to energy, as articulated in the United Nations' Seventh Sustainable Development Goal (SDG 7), is essential for eradicating poverty, fostering economic growth, advancing social development and enhancing human health and well-being (Cole, 2018). Industrialised countries have historically benefited from reliable, affordable and secure energy services that have played a pivotal role in fostering their economic growth and prosperity. In developing nations, access to dependable and cost-efficient energy services is essential for advancing human development initiatives, enhancing productivity, promoting health and safety, achieving gender equality and improving educational outcomes (Alstone et al., 2015). Despite advancements since 2015, in 2021, 675 million people lacked electricity, and 2.3 billion people lacked clean cooking fuels (UN, 2023). In particular, the availability of clean energy services is fundamentally connected to the well-being of women in developing nations. The interplay between energy access, health and gender equality highlights profound impacts on women's overall quality of life. Indeed, while energy poverty poses challenges for everyone, women in developing countries are disproportionately affected due to gender inequalities that further restrict their access to energy resources (Winther et al., 2020).

The analysis is carried out in the following way: first, we present the human development process according to the capability approach; second, we introduce the energy factors in that process and, specifically, we illustrate the energy capabilities; finally, within this framework, we study the impact of climate change on women's energy capabilities.

12.2 The model

The human development process

According to the capability approach, human development should be understood as a conversion process of expanding individuals' capabilities through the conversion of economic and material resources into capabilities (Sen, 1999). Capabilities refer to the real freedoms or opportunities individuals have to do or be what human beings value, encompassing actions and states such as fulfilling basic needs (e.g., access to food and water) or obtaining education, healthcare and political participation. These capabilities are realised and transformed into functionings through individual and collective choices that are influenced by personal preferences, social attitudes and contextual factors. Shifting focus from resources to individual functioning and capabilities consists of moving the emphasis from the "*means of living*" to the "*ends*" and "*real opportunities*" available to an individual and communities. It highlights the instrumental role of resources in enhancing well-being by converting them into capabilities through the conversion factors (Robeyns, 2003). These conversion factors fall into three categories: 1- personal, such as physical and mental characteristics (age, gender, metabolism, health conditions, etc.); 2- social, including institutions and social norms, traditions, gender roles and social relationships; 3- environmental, such as climatic conditions and geographical location (Comim et al., 2008).

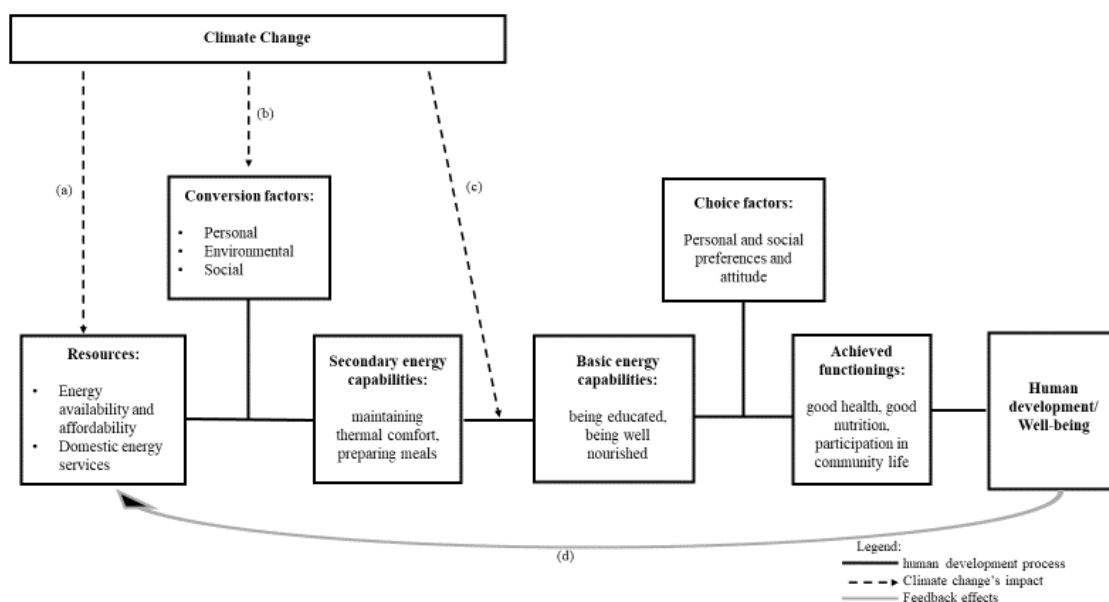
Energy and human development process

Let us insert energy factors into the human development process by taking into account that energy has an essential role in achieving valuable capabilities and human development (Sen, 2014). As shown in Figure 1 by the continuous lines, the availability and affordability of energy vectors and domestic energy services are crucial preconditions for realising valuable capabilities. Indeed, individuals are not interested in energy per se but rather in the domestic energy services it provides, which are vital for human well-being and fulfilling essential needs such as cooking, heating, lighting and mobility (Bouzarovski and Petrova, 2015). The latter is fundamental for enabling them to perform daily activities and pursue opportunities for self-actualisation in alignment with their choices and potential. These services allow individuals to transform domestic energy resources into *secondary energy capabilities*, such as the ability to cook meals and adequately heat their homes. These secondary energy capabilities are crucial for expanding *basic energy capabilities* (e.g., maintaining health and proper nutrition). This sequential relationship can vary according to the *conversion factors*. For instance, heating needs are determined by household sociodemographics, health conditions and local climate. In addition, cultural aspects and social norms play a role in shaping how much time is spent at home and how heating services are used (Grazini, 2023). Ultimately, *choice factors* influence how basic capabilities are converted into meaningful achieved functionings that enhance individual well-being.

Resulting in a socially and materially inadequate level of domestic energy services, energy poverty¹ deprives individuals of basic capabilities but also of other essential ones for individual and collective development, such as access to education, social relationships, social trust and political participation (Walker et al., 2010). Bad living conditions heighten the risk of respiratory,

cardiovascular, malnutrition, and mental health issues, including stress and depression. Energy poverty exacerbates these challenges by fostering social withdrawal, isolation and financial strain, often discouraging social participation. This cycle perpetuates social exclusion, trapping individuals in a state of social exclusion (Grey et al., 2017).

FIGURE 4: The impacts of climate change on women's energy capabilities



Source: Authors' original contribution

Climate change, energy and women's human development process

Climate change poses a significant challenge with far-reaching impacts on both lives and livelihoods. As illustrated in Figure 1 by the dotted lines, it can exacerbate women's energy vulnerability and intensify inequalities in human well-being. Energy poverty in developing countries is characterised by limited access to modern energy sources essential for delivering contemporary energy services. This phenomenon can be attributed to inadequate infrastructure, poorly functioning energy service markets and insufficient financial resources to afford modern energy solutions (Sy and Mokaddem, 2022). The latter aspect is particularly relevant for women, who often rely on natural resources and are employed in the agricultural and forestry sectors – sectors that are particularly vulnerable to the adverse effects of climate change, as indicated by arrow (a) in Figure 1. These impacts weaken women's financial resources and household income, constraining their ability to purchase modern energy sources to maintain health or prepare meals. In developing countries, these capabilities also depend on the availability of energy resources because approximately one-third of the global population, especially women for their critical role in securing household energy (Acheampong et al., 2024), depends on solid fuels such as wood and crop residues for cooking and heating. In rural areas, women often dedicate a significant amount of time to collecting firewood, limiting their ability to participate in productive economic activities that could improve their livelihoods. Climate-related factors, including heat, droughts and extreme temperatures, exacerbate the depletion of energy and water resources. As a result, women are compelled to travel long distances to obtain fuel and water for essential household activities such as cooking, bathing and cleaning. This strain negatively impacts their capabilities to maintain health, prepare meals and achieve adequate nutrition, ultimately hindering the broader human development process.

Climate change compromises not only the means of women's development processes but also their ability to convert limited resources into energy capabilities, as suggested by arrow (b) in Figure 1. For example, being healthy is not only an end, but represents an important personal conversion factor. As indicated before, the damage to local ecosystems due to climate-related disasters compromises environmental conversion factors (Dimitrov, 2019) by requiring women to travel ever greater distances in search of low-quality fuels with heavy consequences for their health, which may already be compromised due to continuous exposure to harmful air pollution from indoor traditional biomass stoves (Ssennono et al., 2023). This *personal conversion factor* could also be further compromised by the faster spread of disease vectors that occurs during climate-related catastrophic events, which seems to affect women more than men. Indeed, climate change compromises both the physical and mental health of women in rural communities, where climate change factors are linked to several mental health challenges such as depression, anxiety, stress and post-traumatic stress disorder (Daraz et al., 2024). This fact compromises the conversion of means into secondary energy capabilities (for instance, being able to prepare meals), which, in turn, reduces the set of basic energy capabilities (i.e., being healthy), compromising the human development process. *Social conversion factors*, such as cultural norms and societal expectations, play a significant role in shaping gender roles. In patriarchal societies, women are often assigned primary responsibility for unpaid care work (Aloè et al., 2024), including providing lighting, heating and cooking for households. This burden is further intensified by male migration to urban areas and health challenges arising from extreme weather events (MacGregor et al., 2022), as indicated by arrow (b) in Figure 1. Moreover, climate change, through poor harvests, shifting growing seasons, and the spread of pests, places additional strain on women, which exacerbates their secondary energy capabilities, such as preparing meals needed for achieving the basic capability of being well nourished. However, the latter also depends on the availability and quality of food, which is among the first elements to suffer from a range of climate-induced extremes, including droughts, heatwaves, irregular and intense rainfall, storms, floods and the emergence of insect pests (Habib-ur-Rahman et al., 2022), as suggested by the arrow (c) in Figure 1. The unpaid energy household burden limits the time that women can dedicate to their education and perpetuates a cycle that hinders human development. By increasing reliance on traditional fossil fuels, climate change intensifies unpaid care responsibilities, reducing time for self-care not only for women but also for girls. Often, girls are compelled to leave school to assist their mothers in collecting biomass fuels and managing household duties, further entrenching gender inequalities. All these factors can cause feedback effects and a *climate change-low human development trap*. Indeed, in Figure 1, the grey arrow (d) suggests that lower human development caused by climate change, which is frequently associated with limited access to education, technology and financial resources, can limit women's decision-making power and reduce their capability of adapting to climate-related challenges or implementing adaptation strategies (Daoudi, 2024; Meir et al., 2022; Sart et al., 2022). Consequently, this disempowerment of women will exacerbate the negative impact of climate change on the human development process.

12.3 Conclusion

The social and gender challenges of climate change require a multidimensional analysis of social inclusion, environmental sustainability and energy poverty alleviation with a focus on the interplay between local development systems and the enhancement of individual and collective energy capabilities (human capabilities related to energy). Addressing the intersection of climate

change and women's development necessitates integrating gender perspectives and energy capabilities into climate policies. In light of climate change, the nexus of energy services and women's well-being in developing countries underscores the need for targeted policies that promote clean energy access and sustain women's coping strategies. Such policies should aim to reduce health and education disparities, enhance women's economic opportunities and, ultimately, contribute to achieving the Sustainable Development Goals (SDGs) related to health, education and gender equality (Shastry and Morse, 2023). The risk of a climate change-low human development trap highlights that the abovementioned achievements make climate change strategies more effective and practicable. Some of the elements analysed in the model are part of the social and economic structures; for this reason, institutions have to promote ecological structural changes to transform the production and social systems for an ecological conversion (Grazini et al., 2024; Guarini and Oreiro, 2023). This article indicates that with reference to climate change, mitigation and adaptation policies entail an improvement in energy access not as a mere infrastructural challenge but as a fundamental component of advancing women's energy capabilities and empowerment in developing contexts.

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